

IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

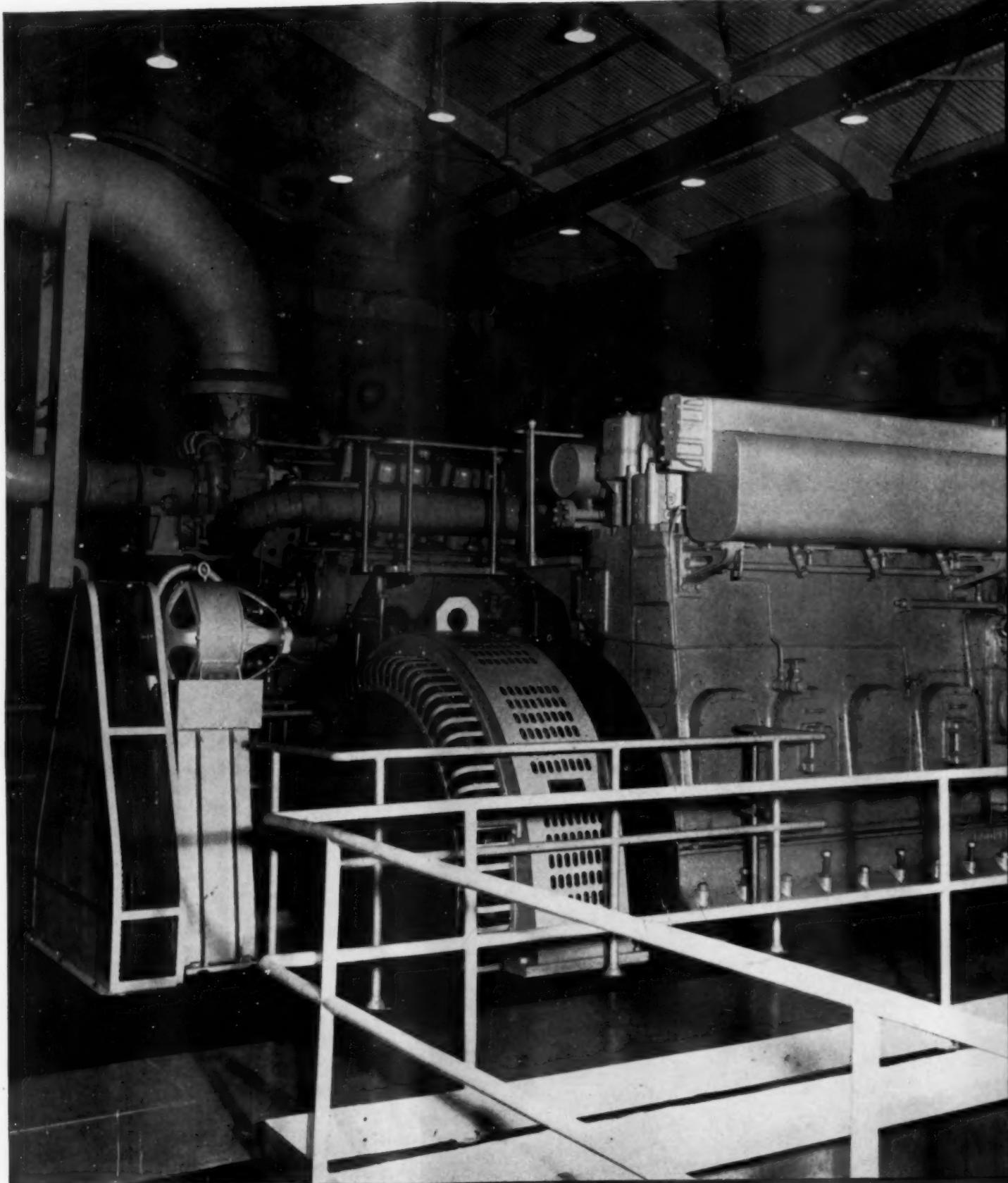
~~DEFENSE~~  
PROGRESS

UNITED STATES

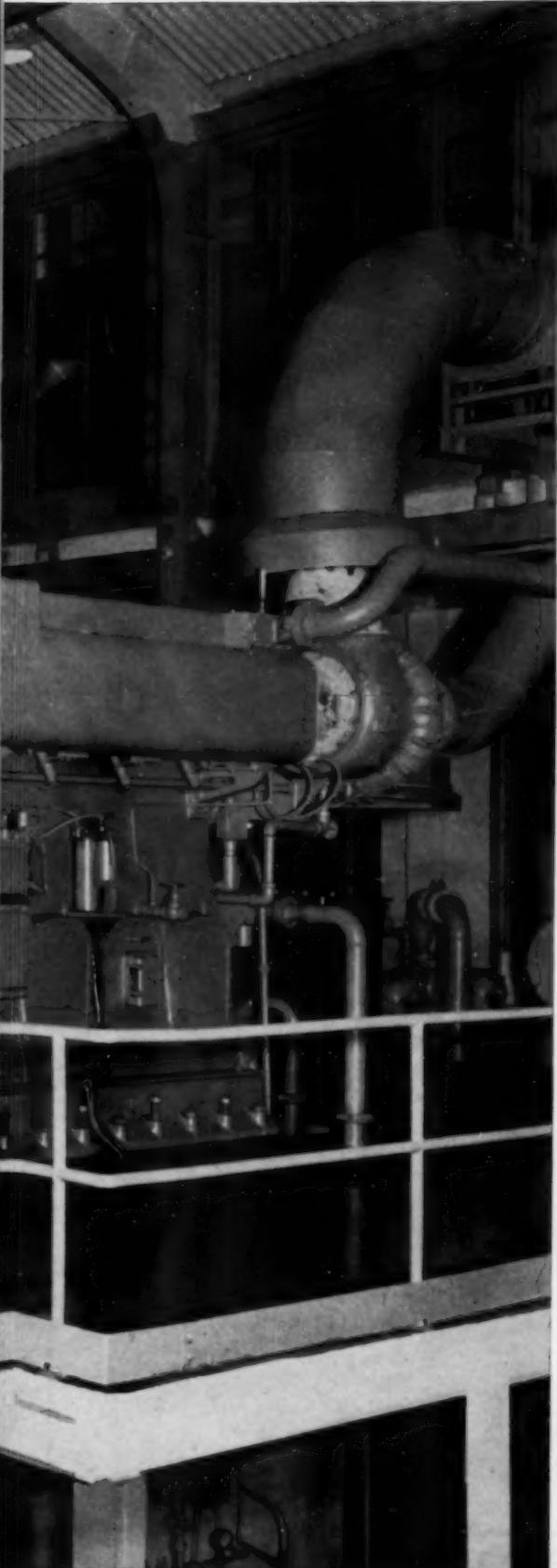
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POWER PLANT OPERATORS REPORT:

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According to actual case history reports, power plant engines show a power performance improvement when lubricated with *Texaco Ursa Oils*. This is because *Texaco Ursa Oils* 1) help keep rings free for full-power compression and complete combustion, 2) resist oxidation and sludging, 3) prevent harmful deposits, 4) reduce wear.

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IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

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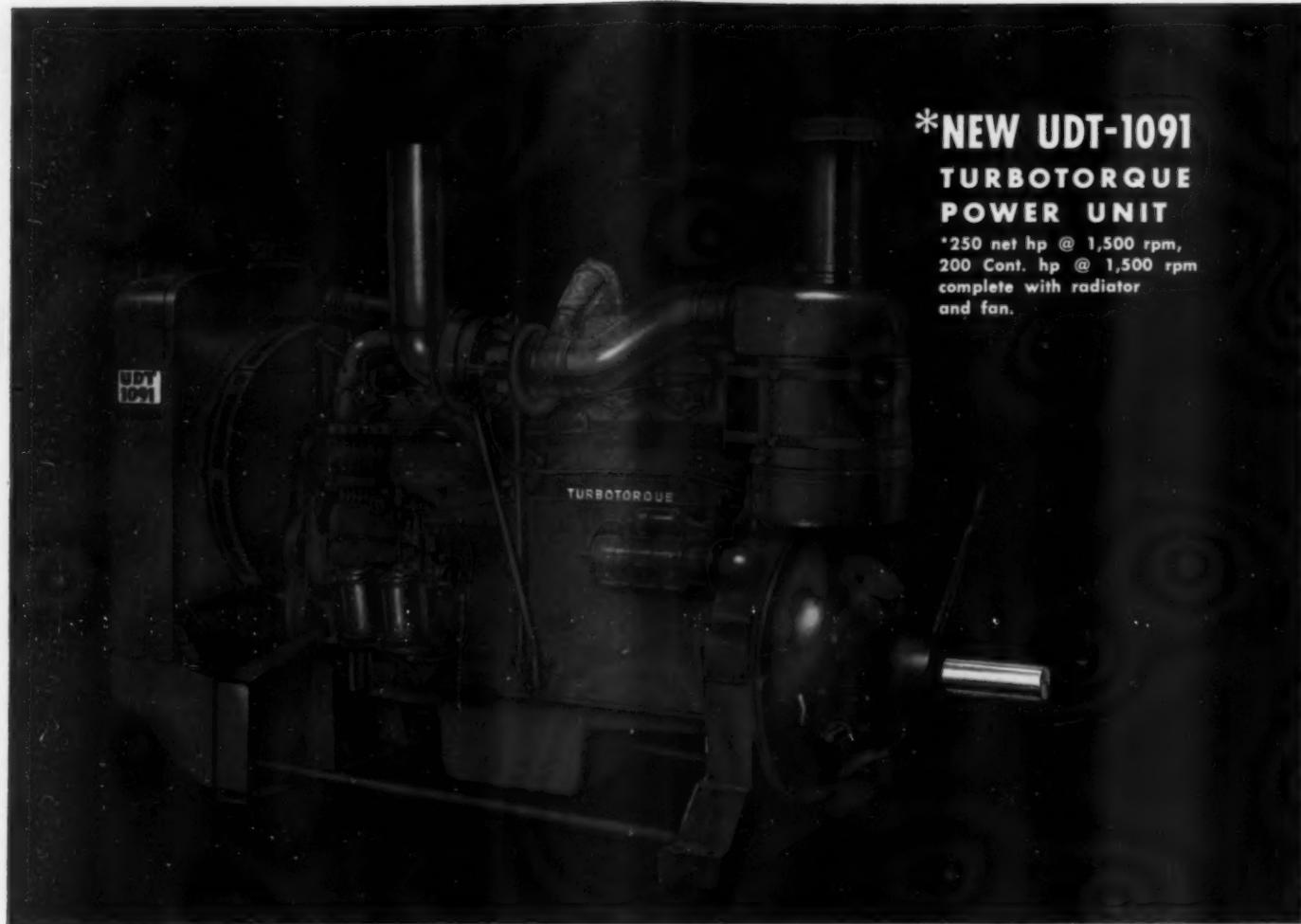
## FRONT COVER ILLUSTRATION

M/V United States, 127  
ft steel tuna clipper,  
built by National Steel  
and Shipbuilding Co. It  
is powered with a 960  
hp Fairbanks-Morse  
diesel.



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## \*NEW UDT-1091 TURBOTORQUE POWER UNIT

\*250 net hp @ 1,500 rpm,  
200 Cont. hp @ 1,500 rpm  
complete with radiator  
and fan.

# New 250 hp \*Turbotorque International . . . power cost-cutter for your big machines

Now—lower cost, more dependable power for your big driven machines—the new 250 hp Turbotorque International UDT-1091 power unit. And that's on-the-job shaft horsepower—not the inflated laboratory variety against which big deductions must be made for fan, radiator, accessories, plus altitude and air temperature.

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The UDT-1091 has all the features that have made

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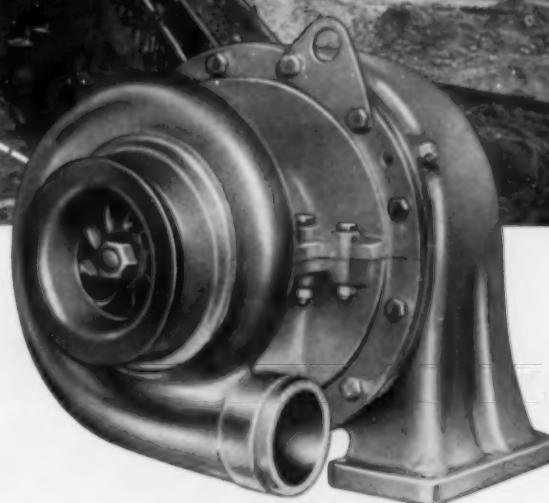
# AIRESEARCH TURBOCHARGERS

## BOOST INTERNATIONAL HARVESTER

### DIESEL POWER RATINGS



**AIRESEARCH TURBOCHARGED** International Harvester UDT 1091 diesel is used to power this rock crushing equipment 5000 feet high at Pueblo, Colorado. Rock crushed is from 10 inches maximum to one inch minus with a 40% crush. The AiResearch turbocharger has increased the rock crusher's production by 20%, and not only boosted horsepower 20 - 30% over the diesel's previous output at that level but actually raised it over its sea-level rating. Approximately 1800 tons of rock are being crushed in eight hours by the turbocharged UDT 1091 compared with 1400 tons in an equal period with a non-turbocharged unit. The AiResearch turbocharged UDT 1091 prevents stalling under heavy loads and has operated for over 2500 hours at elevations in excess of 5000 feet with no "down time."



**AIRESEARCH C-60 TURBOCHARGER NOW AVAILABLE ON INTERNATIONAL HARVESTER UDT 1091 DIESEL ENGINE**

#### Installation maintains sea-level output up to 12,000 feet with an important decrease in fuel consumption

AiResearch turbochargers have an outstanding record of operation in the field. Features include turbine wheels of unmatched efficiency, air-cooling which eliminates the need for complicated plumbing and ease of installation and maintenance. Thermal loading on the

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supercharging installation. Your inquiries are invited.

BASIC SPECIFICATIONS FOR AIRESEARCH TURBOCHARGERS					
MODEL	F-51	C-60	A-60	E-100	B-100
Diameter - in. nom.	10	11.5	15.25	15.1	15.4
Length - in.	10.5	12.9	16.75	14.7	17.1
Weight - lb.	40	95	125	112	135
Output - lb/min. (Standard Conditions)	29.51	30-60	38-60	50-100	60-100



**AiResearch Industrial Division**

9225 South Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS



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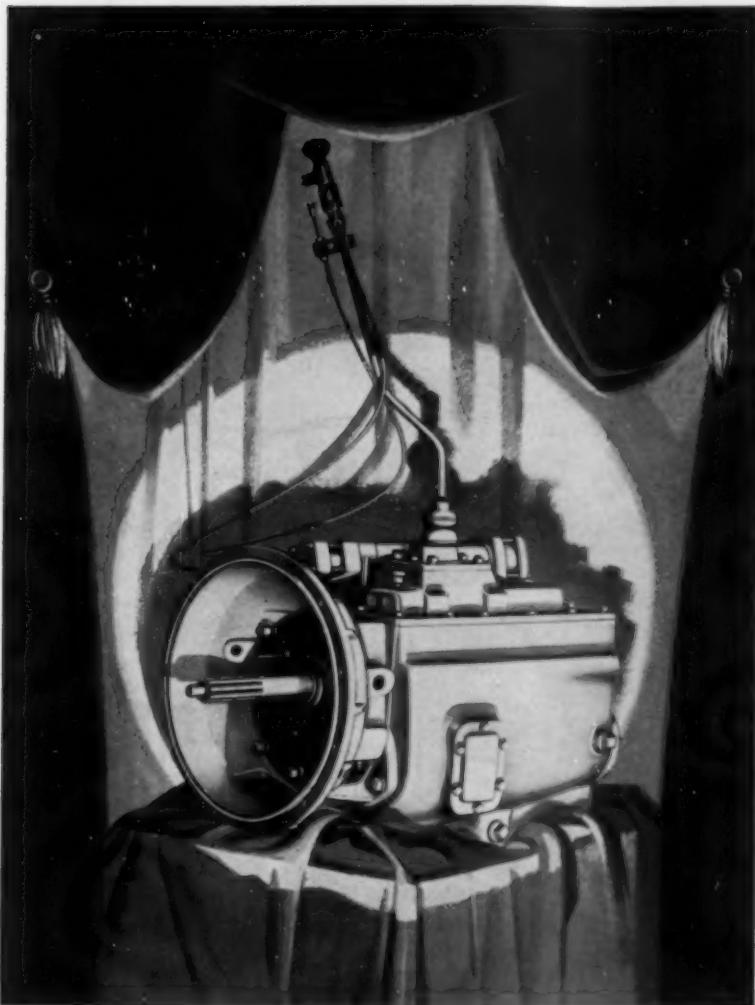
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**SHELL TALONA R OIL 40**



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This is a new concept of excellence in mechanical engineering design and manufacture.

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This is the revolutionary new Spicer Synchro-Master 12-Speed Transmission:

12" shorter, 200 pounds lighter than any other multiple-speed transmission of comparable capacity;  
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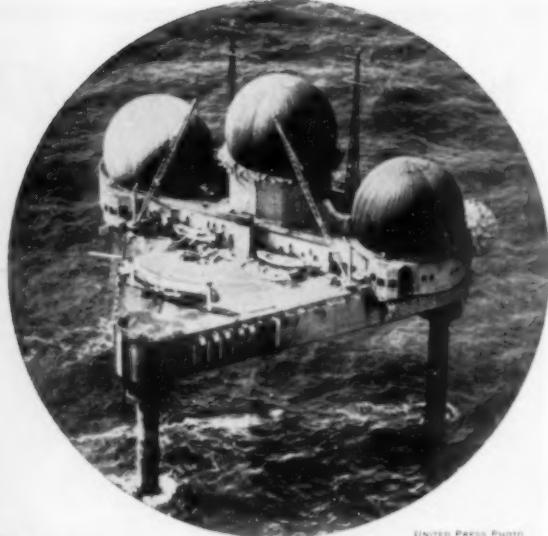
Blocker-type synchronizers in all speeds, forward and reverse. All six low range ratios available in reverse. Forced feed lubrication. Screen for filtering oil. Standard six-bolt S.A.E. power take-off apertures on each side. Equally spaced steps between ratios. Replaceable bearing retainer inserts in all case bores. Tower or remote control types.

Ask Dana engineers to help you adapt this revolutionary new Spicer Transmission to your heavy-duty truck requirements, for new standards of economy and performance.

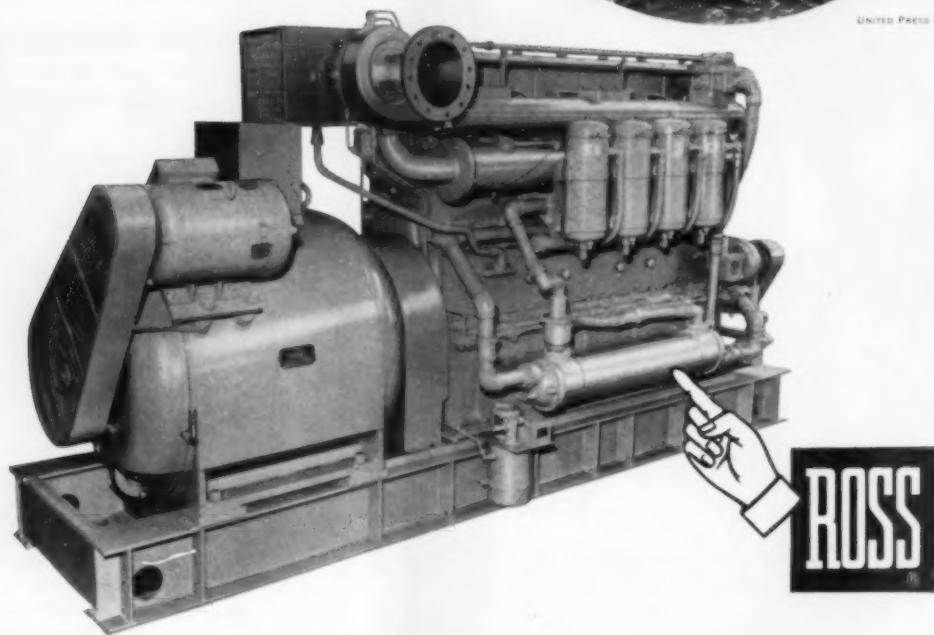


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## stand guard over Superior Generator Sets aboard "Texas Tower"



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Ruggedly built and top-rated for thermal effi-

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Completely pre-engineered, these compact units are fully standardized in sizes to meet a wide variety of oil, water, gas and air cooling requirements.

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## ROSS HEAT EXCHANGER

Division of AMERICAN - Standard



# The Engineer's Field Report

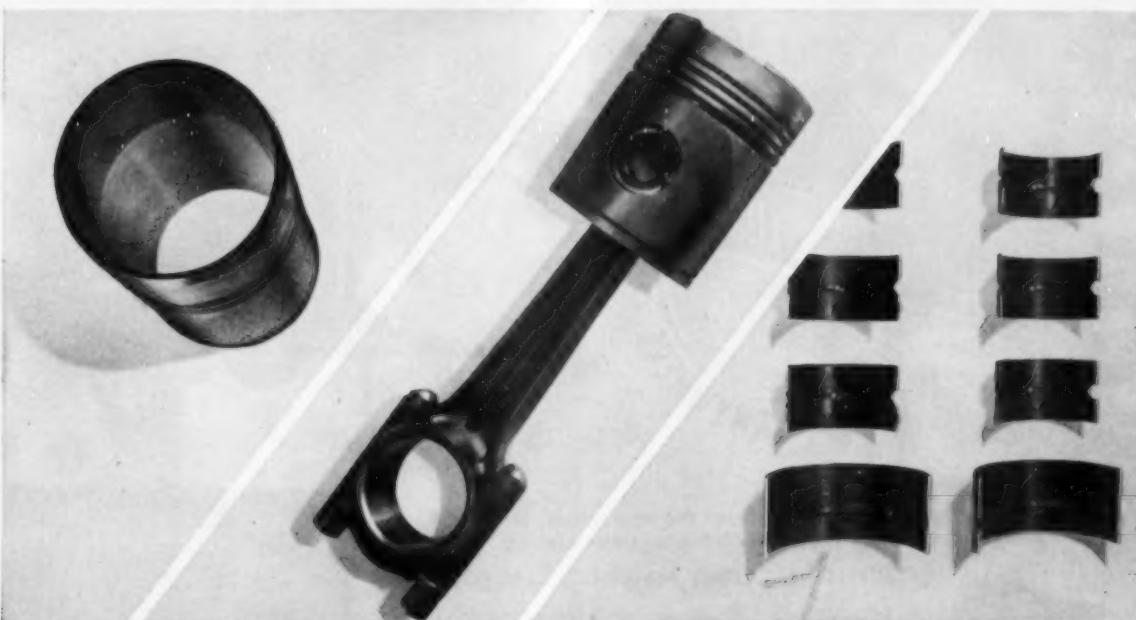
## CASE HISTORY

RPM DELO Oils

LUBRICANT

Progressive Transportation Co.  
FIRM Compton, California

## RPM DELO holds piston wear to .001" after 201,253 miles of on-and-off highway hauling



LUBRICATED WITH RPM DELO Oil, these engine parts were pulled from a Cummins HR diesel after 201,253 miles. A portion of this mileage was put on during four months of rugged service spotting loads of heavy pipe in the Arizona desert. When the engine was taken down, after two years of this on- and off-highway hauling, Progressive Transportation Co. found RPM DELO Oil had kept lacquer, gum, sludge, and deposits from forming...rod bearing wear varied between .0005 and .001 inch and pistons showed maximum wear of only .001". No wear at all evident on

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### Why RPM DELO Oils prolong engine life

Special com-  
pounds stop  
corrosion

Anti-oxidant  
resists lacquer  
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keeps all  
parts clean



Metal-adhesion qualities keep oil on parts in running or idle engines—Inhibitor resists foaming



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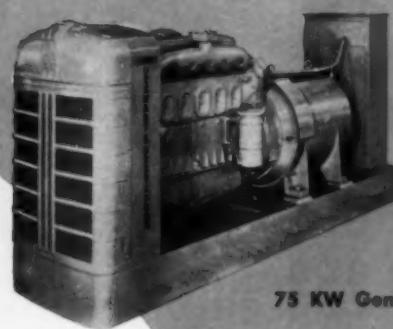
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All units can be furnished with either diesel engines or gas, gasoline or butane engines.

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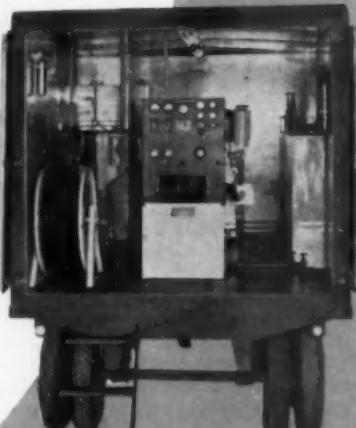
6-110 Industrial Quad  
1000 HP



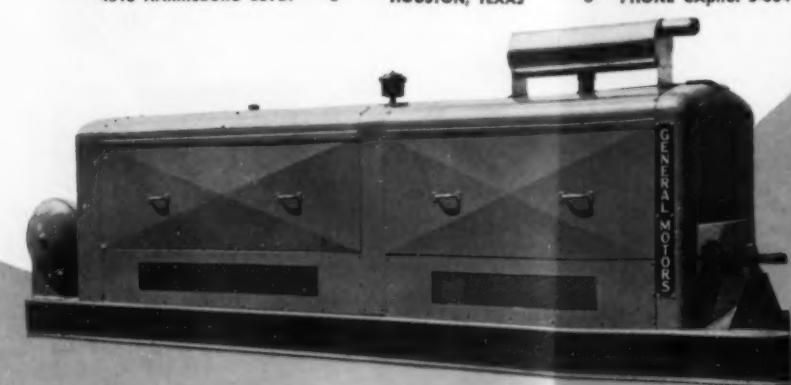
75 KW Generator Set



Portable Pumping Units



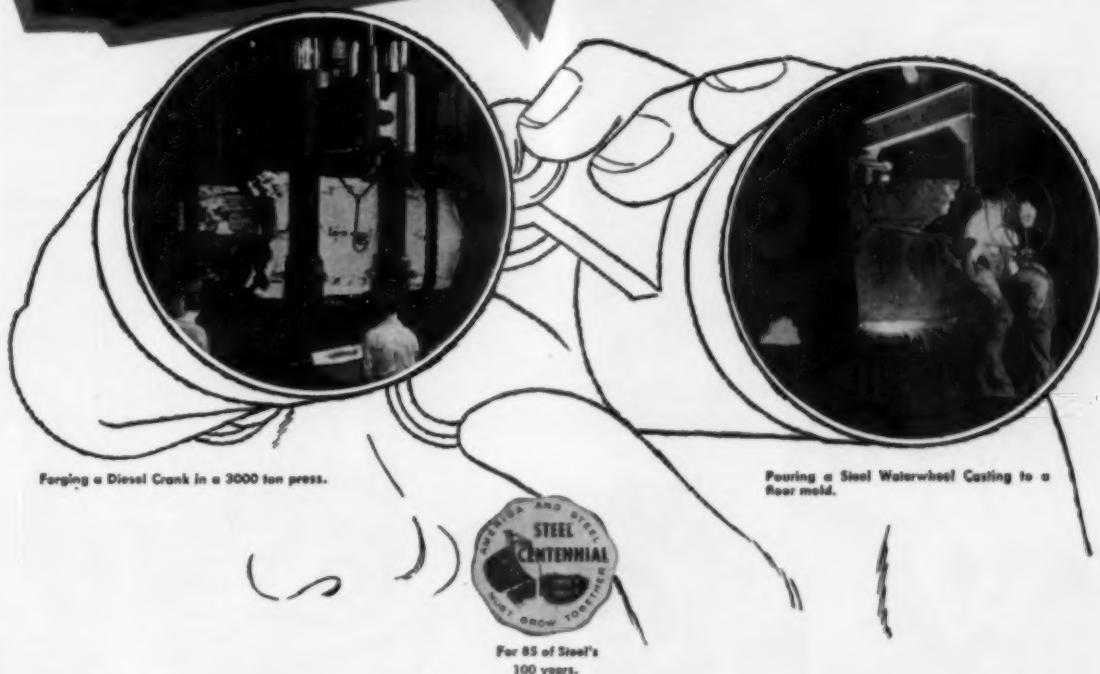
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Electric Power Plant



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Rig Lighting, Welding  
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**they've all got this in common...**  
**protection from dirt with Purolator filters**

*Filtration For Every Known Fluid*

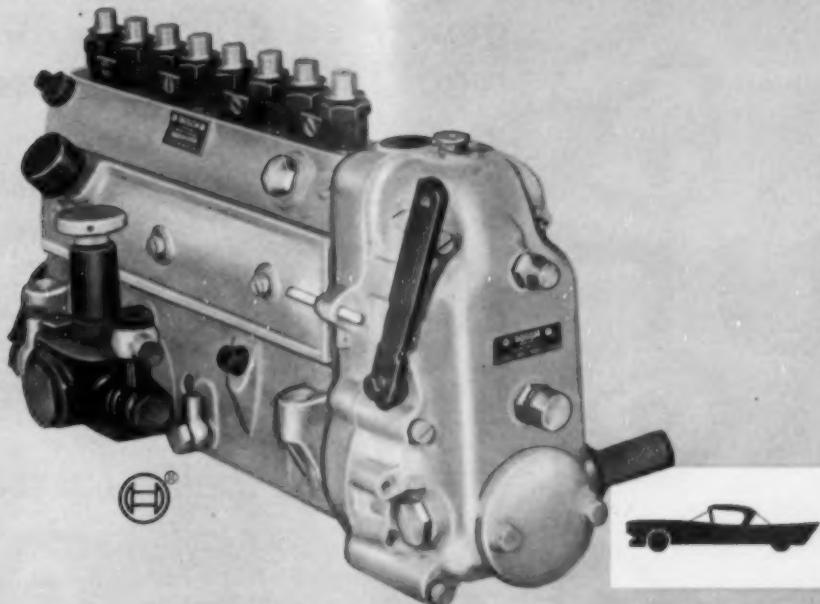
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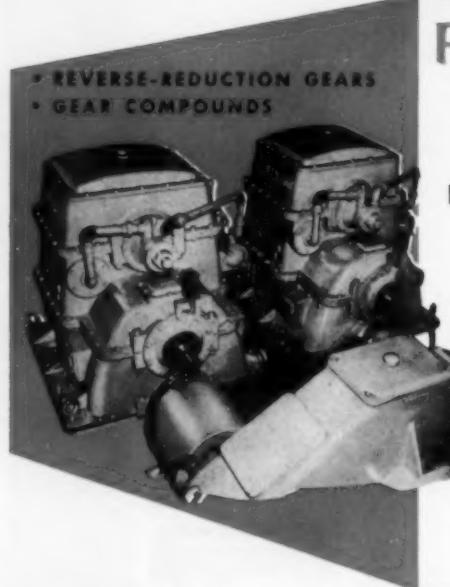
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generated precision quietness  
rugged dependable horsepower

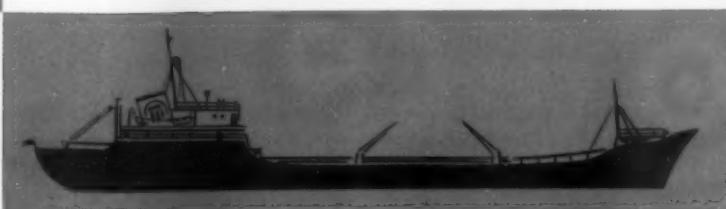
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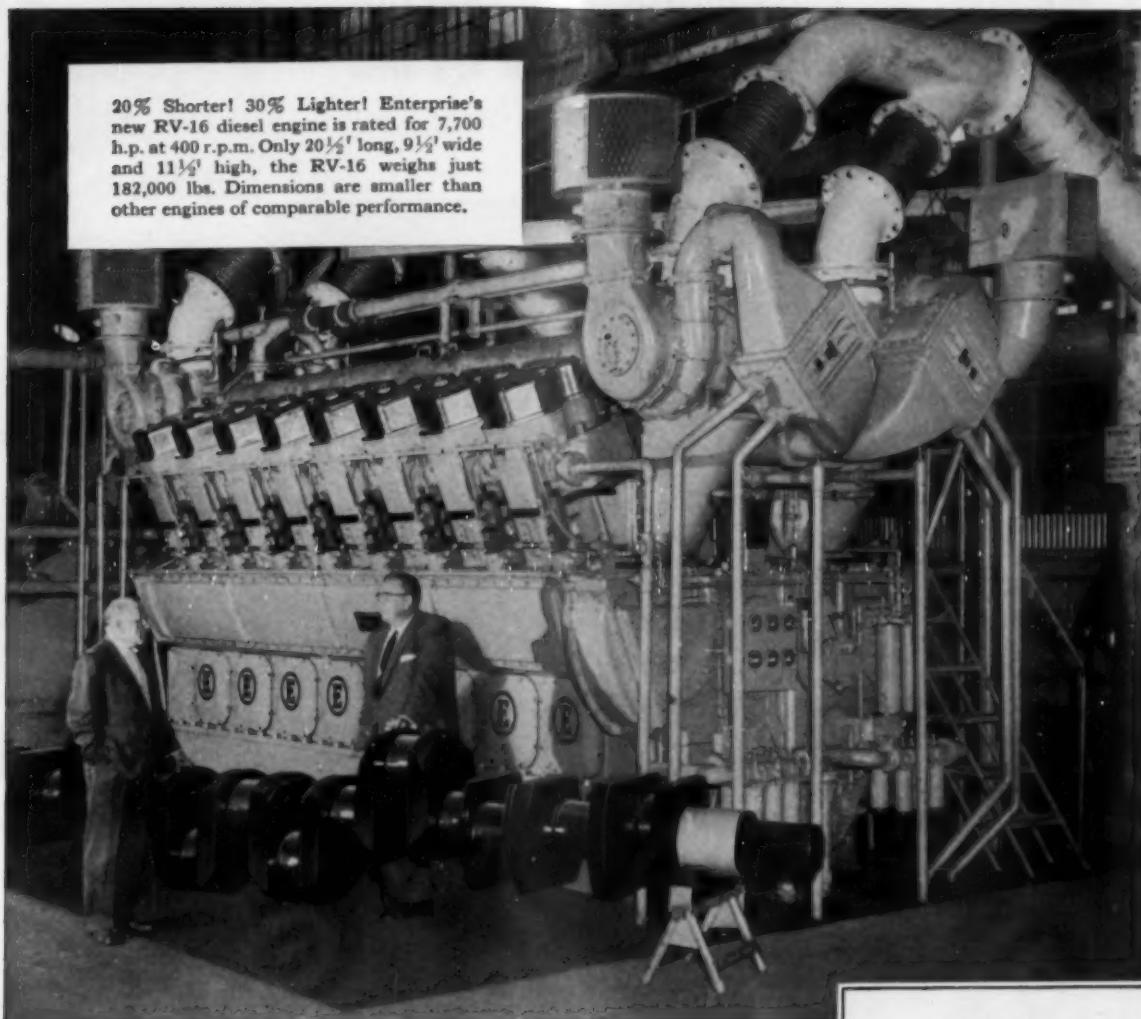


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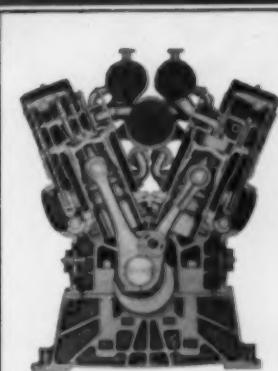
the most dependable source of supply.

If you have a problem of ring application, avoid further needless expense. Take advantage of Koppers experience, research facilities and craftsmanship. Write for information today. KOPPERS COMPANY, INC., Piston Ring and Seal Department, 1408 Hamburg Street, Baltimore 3, Maryland.



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Engineered Products Sold with Service



Cutaway shows internal design  
of the RV-16

## *"Allis-Chalmers Diesels on the 'MR. GEORGE' give wonderful service,"*

SAYS CAPTAIN DAYTON A. SMITH



Captain Dayton A. Smith comes to Baroid's "Mr. George" after 30 years of service in the U.S. Navy, from which he retired as a Lt. Commander.



The "Mr. George" is 196 ft long, 42 ft wide, 12 ft deep—has payload capacity of more than 1,500 tons of bulk BAROID® and other drilling mud additives. It carries Coast Guard Customs Registration and Star A-1 American Bureau of Shipping Certification.

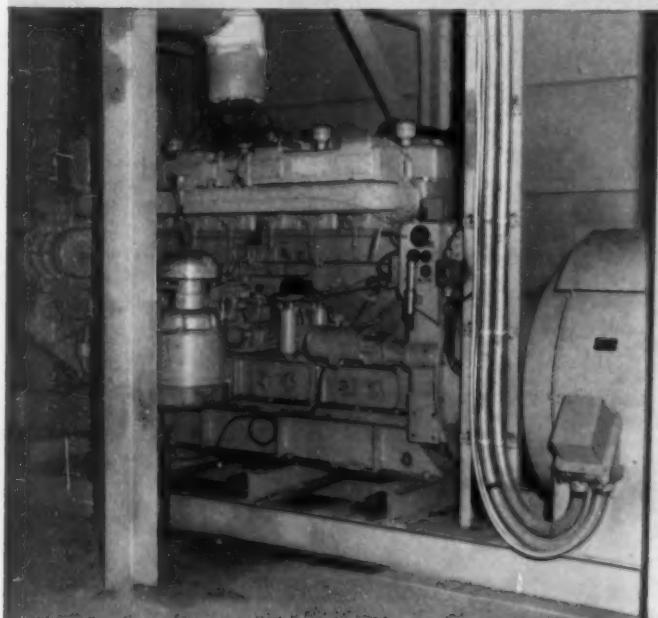
\*Registered trademark of Baroid Division, National Lead Company.

"And believe me," Captain Smith continues, "diesel engines operating under the exacting conditions found on a mud delivery vessel, such as the 'Mr. George,' get a real test for endurance and efficiency."

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ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN



One of two Allis-Chalmers Model 2505 diesel engines driving 250-kw generators, providing power for propulsion, pumping, winches—all equipment aboard the "Mr. George."

BM-17

# ALLIS-CHALMERS





## SUPERIOR 1400-H. P. DIESEL AND BENDIX INJECTION PUMPS CUT FUEL COSTS 53%

When Straits Towing, Limited, of Vancouver, B. C., repowered its eleven-year-old tugboat, the "Johnstone Straits", with a new 1400-H. P. White Superior diesel using Bendix\* injection pumps, remarkable operating savings were immediately effected.

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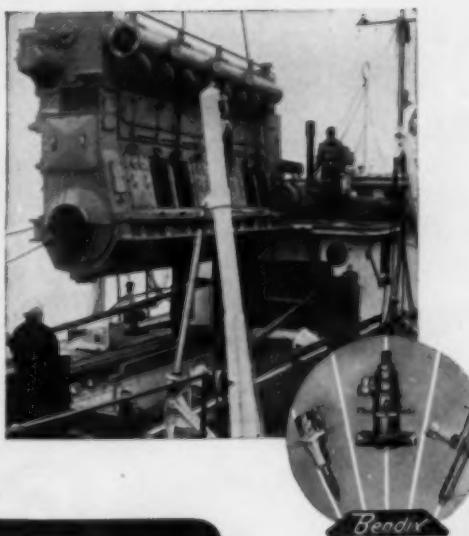
The "Johnstone Straits" is in service on the British Columbia coast and is used to tow heavily loaded ore barges and to haul huge log rafts over a 600-mile run.

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That's why you will find that wherever the job requires completely dependable service at low operating cost, Bendix is the choice for fuel injection equipment.

\*REG. U. S. PAT. OFF.

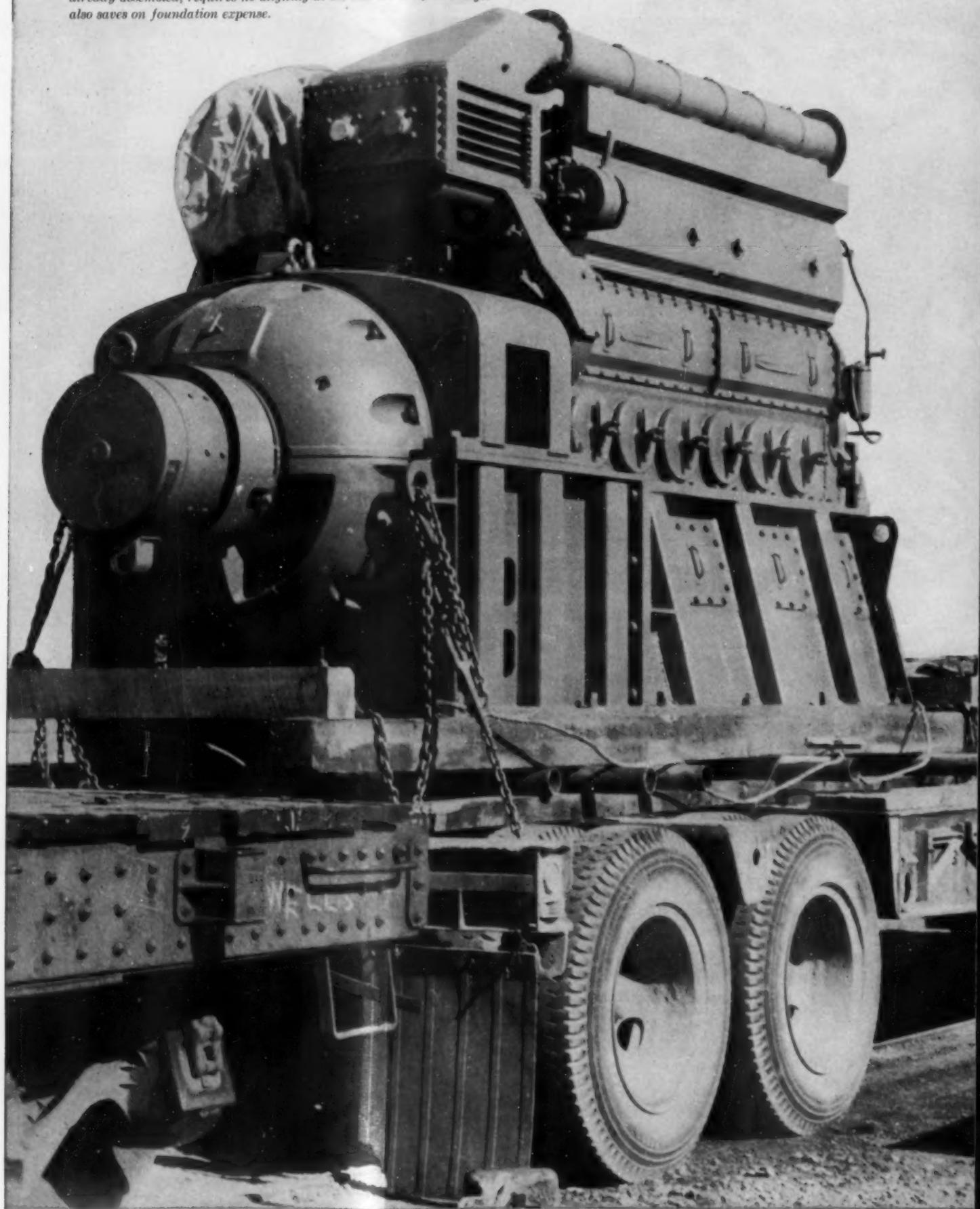
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Scintilla Division  
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# 1957 POWER!

Long famed for reliability, Worthington 1957 power engines have many new features that can help you produce permanent or standby power at the lowest costs ever achieved for real *heavy-duty* units.

**LOWER INSTALLATION COSTS**—The new SW 9 engine you see at left has been "unitized" with its generator to drastically cut space requirements, installation time and expense. This design requires no aligning at the site. Should needs ever change, the entire unit can just as easily be picked up and moved to another location.

**LOWER FUEL COSTS**—In 1957, Worthington is pioneering in power by designing and building engines *specifically* for turbo-charged operation. The SW 14, for example, is America's first high output diesel built only for high pressure turbo-charging.

For economy today and tomorrow, all '57 Worthington power engines can be furnished to run on the lowest cost, locally available fuels—residual, crude, and distillate oils; natural, sewage, propane or manufactured gas.

**LOWER MAINTENANCE COSTS**—With Worthington's 1957 engine line, you enjoy the economy of modern power design plus amazingly low maintenance. One of the many maintenance-saving features of the new SW 9, for example, is the Jet

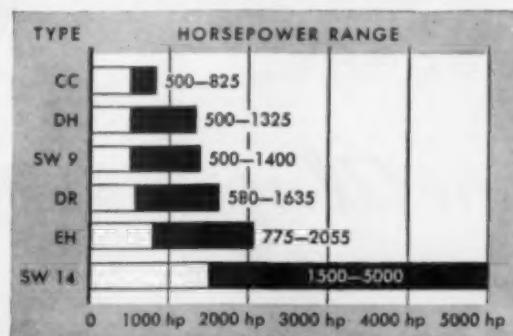
Swirl combustion chamber. The chamber is designed so that the air swirls as it enters the cylinder assuring rapid mixing of air and fuel for extremely clean combustion giving longer valve and liner life, as well as ultra-efficient operation.

The fact that every upper mechanical part is within reach from the operating level is another maintenance saving feature.

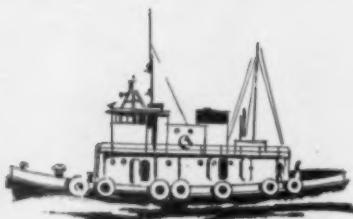
For reliable power in the 500 to 5,000 hp range, at the lowest possible cost, get in touch with your nearest Worthington District Office. Worthington Corporation, Harrison, N. J. In Canada: Worthington (Canada) 1955, Ltd., Toronto, Ont.

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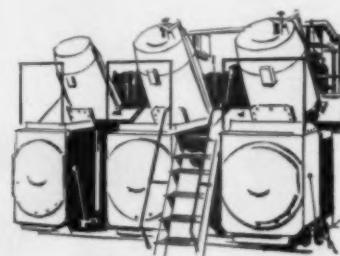
*Choose your next diesel from Worthington's complete line of heavy-duty four-cycle power engines.*



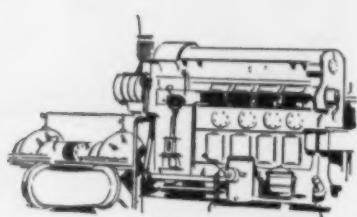
**WORTHINGTON**



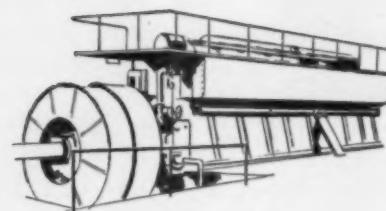
Marine



Engine compressor



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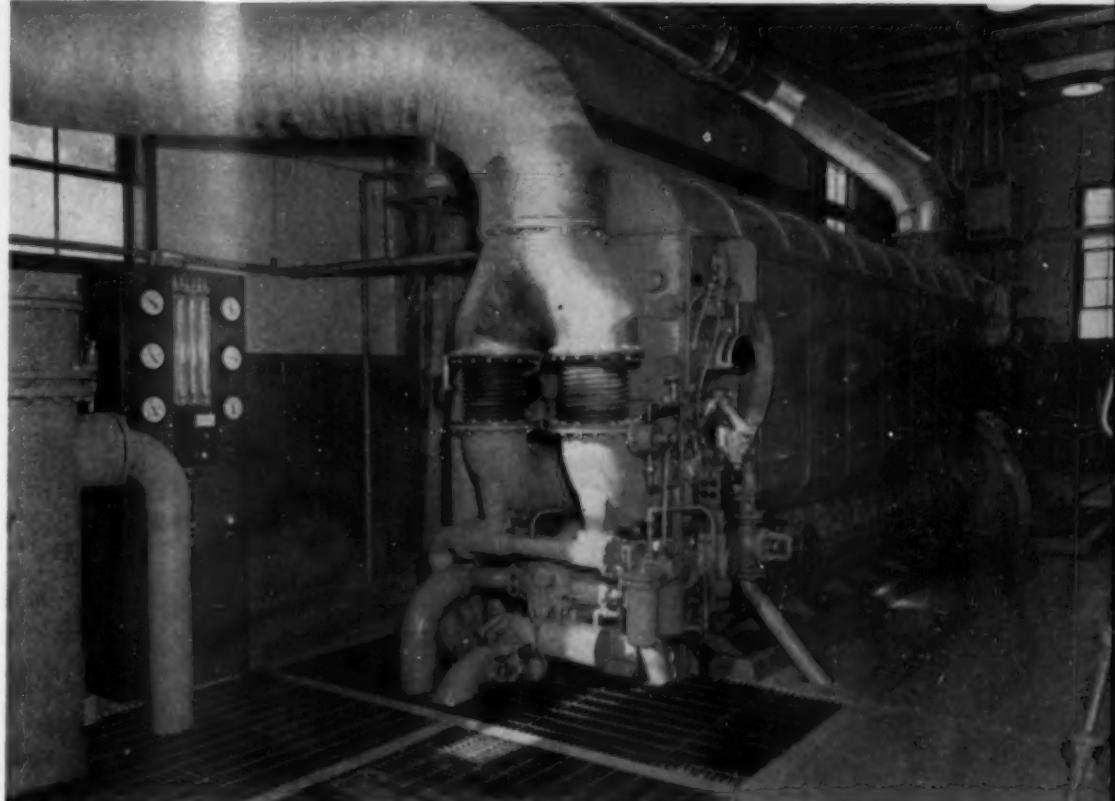
# STOCKTON, KANSAS

**Capable of Operating as Straight Diesel, Dual-Fuel  
Or Spark-Ignition Gas Engine, 7-Cylinder, 840 Hp  
Fairbanks-Morse O-P Averages 3.34 Mills Per Kw Hr on Gas.**

A PAGE in the history of modern power production was turned on September 8, 1952 when a group of engineers at the Stockton, Kansas, municipal power plant converted a 6-cylinder, 840-hp Fairbanks-Morse opposed-piston engine to spark ignition. It marked the first such conversion ever attempted and gave this agricultural community (2,500 pop.) the first successful 2 cycle tri-fuel engine ever developed.

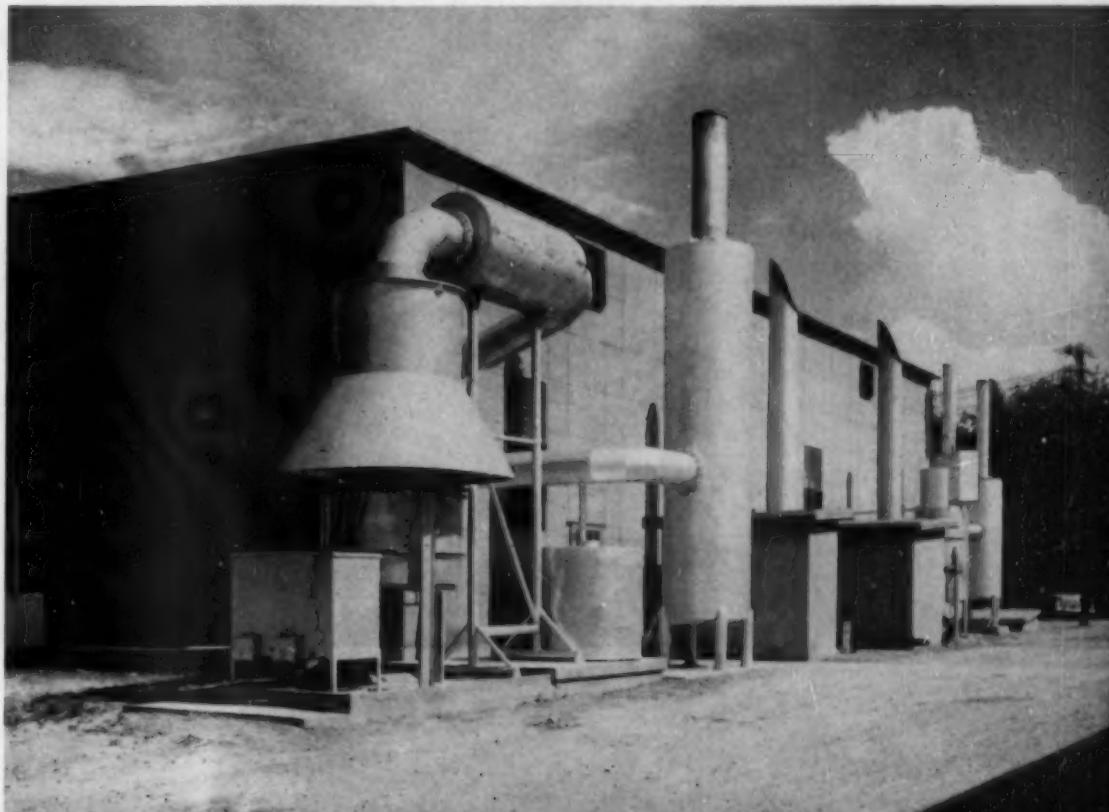
From that date through December 1956, the versatile O-P which can operate on straight oil, dual fuel or straight gas, was in operation more than 60 percent of the time, an operating total of 22,914 hours. The engine never experienced a forced shutdown due to mechanical failure, averaged 5,000 hours per spark plug, and produced 64.5 percent of the plant's total output. Because it was the most economical engine in the five-engine plant, even at light loads, it was often operated at very poor load factors. Experience proved, however, that the tri-fuel O-P could carry a full load safely on any type of fuel, picking up near-capacity loads in a matter of seconds without crackling or detonation, even on spark ignition. Economically, the converted O-P has proven itself by effecting a sharp reduction in the plant's fuel costs. This has been achieved in spite of the fact that the dual fuel engines already were producing power at a modest fuel cost of 5.35 mills per kw hr. Just by replacing pilot oil with gas, the spark-ignition unit cut the plant cost average to 3.73 mills, a saving of 30 percent. In a sense the O-P installed at Stockton is a pioneer engine. Other Fairbanks-Morse opposed-piston engines have been built or converted to spark ignition since September 1952, but this was done on the basis of the success achieved at Stockton. The engine was initially installed in 1951 as a dual-fuel unit and was operated as such for little more than a year before the conversion was made. It was the tenth engine to be installed at Stockton, where municipal power dates back to 1908, and all but three were Fairbanks-Morse units.

Population growth in Stockton has been steady, increasing from 1,391 in 1925 to an estimated 2,500 today. Principal reasons for the increase have been greater oil field activity, the construction of Webster Dam approximately eight miles to the west, and the continued movement of farm people into town. Further increases in population are expected with the completion of the dam, which is a part of the Missouri Valley water conservation project. The City of Stockton has a City Manager-Commissioner form of government and it is the responsibility of these elected officials to see that industrial, commercial and residential consumers are provided with a dependable, economical source of power. Stockton's municipal power plant had its beginning in 1908, when a small 100-hp oil



A control-end view of the 1920 hp dual-fuel O-P showing its Woodward governor, Nugent duplex pilot oil filter, and Midwest Supply Co. gauge board, with Alnor exhaust pyrometer, Trimount U-tube gauges, and Marshalltown pressure and temperature gauges. At left is the unit's Ross lube oil cooler.

Shown outside the plant are (left to right), the American Cycloil air-intake filter and Maxim intake silencer serving the 1920 hp O-P; the Maxim exhaust silencer serving the same engine; exhaust stacks for the two Model 32 engines, and the two Maxim exhaust silencers serving the Model 31 and the tri-fuel O-P engines.



engine was acquired through a \$12,000 bond issue. A few years later, after the use of electricity began to "catch on", another engine of similar size was installed, only to be replaced in 1917 by a 200-hp Fairbanks-Morse unit. The plant had no difficulty in meeting demands until 1926 when it became necessary to add a third engine, a 2-cylinder, Fairbanks-Morse YVA "hot-head" unit, which was rated at 120 hp at 257 rpm and which had sufficient capacity to carry the plant's normal daytime load. This heavy-duty unit remained in service for the next 27 years, finally being sold in 1953. It had been converted to an open-head engine in 1945. In 1930, a 360-hp Fairbanks-Morse Model 32C diesel, which is still used as a standby, was installed, bringing the plant's capacity up to 780 horsepower.

In 1935, the old 200-hp Fairbanks-Morse engine, originally installed in 1917, was retired and a new 280 hp, 300 rpm Fairbanks-Morse Model 32E diesel put in its place. After 1935, twelve years elapsed before the demand increased sufficiently to warrant the installation of another engine. In 1947, a 450-hp Fairbanks-Morse Model 32E diesel was placed on the line, the last straight diesel to be installed at the Stockton plant. In 1949, the first of three dual-fuel units was acquired, a 520-hp Fairbanks-Morse Model 31AD8-1/2 Enbloc engine. The economy realized with this gas burning unit was sufficient to prompt the plant to restrict all straight oil engines to standby and peaking service. A quick glance at the plant's operating records indicates how sharply the demand increased during the post-war years. In

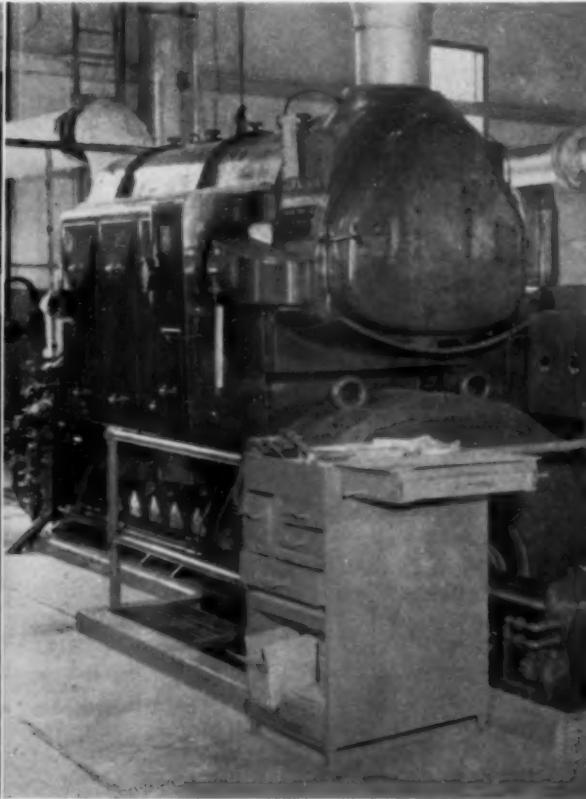
1950, the power plant's gross output was 2,279,996 kilowatt hours. In 1956, the power plant's gross output was 3,409,690 kilowatt hours, a jump of nearly 50 percent. Peak loads showed a greater increase. In 1950 the peak 15 minute demand was 610 kilowatts. By 1952 it had jumped 23 percent to 750 kilowatts and by 1956 it was 1080 kilowatts, an increase of 77 percent in six years. To prepare for the anticipated growth, the Board of Commissioners authorized in 1950 a survey of the city's future power requirements. On the basis of this survey, the 840-hp O-P was installed as a dual-fuel engine in 1951 and in May, 1955, a 1920-hp, 720 rpm Fairbanks-Morse Model 38DD8-1/2, tri-fuel O-P was put on the line, bringing the plant's capacity up to 4,050 hp and insuring firm capacity in excess of peak loads. All Stockton needs now is a firm gas supply and the 1920-hp unit can duplicate the success achieved with the smaller O-P. It was purchased as a tri-fuel unit, but will operate as a dual fuel engine until the gas supply problems are solved.

A measure of this success is the tri-fuel O-P's efficiency and fuel economy record. In calendar year 1951 the Stockton plant produced a gross volume of 2,440,820 kw hrs at a total fuel cost, including oil and gas, of \$13,059.32. This represents an average of 5.35 mills per kw hr. In four full years of operation as a spark-ignition natural gas engine (1953 through 1956) the 840-hp O-P produced 8,355,840 kilowatt hours, 64 percent of the plant total of 13,069,008 kw hrs, generating a kilowatt-hour at an average fuel cost of 3.34 mills. This enabled the plant to turn out its 13,069,008

kw hrs for a total fuel bill of \$48,767.45, an average of just 3.73 mills per kilowatt hour. This saving as compared with the 1951 average of 5.35 mills was obtained in spite of a rise in gas prices. Savings achieved by this one engine have meant a reduction of more than \$21,000 in the plant's fuel bill. With performance such as this, the Stockton plant which has always been a profitable enterprise for the city has become even more profitable. It is largely through funds provided by the municipal power plant that the Board of Commissioners is able to pare the local tax rate down to 27.5 mills in 1956 and, equally significant, to hold assessed valuation down to one-fifth of actual valuation. Other benefits returned to the people of Stockton by their power plant include free power for the municipal water department, street lighting, the municipal sewage disposal plant, library, parks and all municipal buildings. This service alone is valued annually at approximately \$10,000. Free power is also provided for night baseball and tennis, for Christmas lighting, and for the annual Roots County Fair, one of the largest and best county fairs in the state. The natural gas used in the tri-fuel O-P comes out of the Hugoton fields in southwest Kansas and has a guaranteed higher heating value of 952 btu per cubic foot. It arrives at the Stockton plant at 60 lbs and is reduced in two stages before reaching the engine, first to 40 lbs before the meter and then to 25 lbs at the engine.

Pilot oil for the dual-fuel engines is delivered by truck and has an average heating value of 139,800 btu per gallon. It is unloaded into three steel storage tanks located above ground but below plant level. City water is used in each closed jacket water system and in the two raw water systems. In the mains, the water varies in hardness from 26 to 32 grains per gallon. Before addition to the jacket water systems, therefore, it is reduced to zero

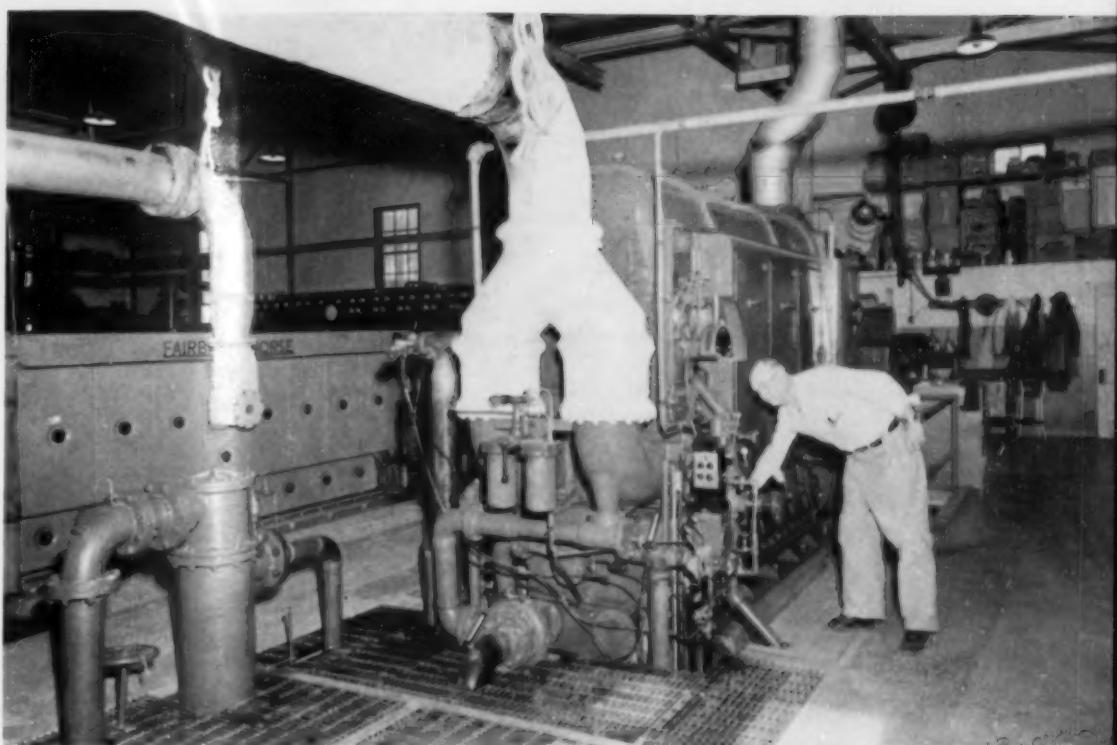
Grouped here are the men principally responsible for the success of the soundly engineered plant (left to right): E. P. Mason, Commissioner; Floyd Lightfoot, Plant Superintendent; John Towns, Commissioner; Harley E. Lucas, former City Manager, Wayne McCaslin, City Attorney; C. E. Hughes, Mayor; and Fred McMichael, Superintendent of Distribution. C. N. Harper (not in picture) has succeeded Mr. Lucas as City Manager, City Engineer and Superintendent of Utilities.



hardness in a zeolite softener and is treated with chromate pellets. All raw water is similarly treated in order to stabilize scale formation and corrosion. Because of the hot summers common in this section of Kansas, the air-intake filters serving the two Fairbanks-Morse O-Ps are equipped with cooling devices. Both are of the oil-bath design and both use raw water as a coolant. All power leaves the plant at 2400 volts and is controlled at a 14-panel switchboard which includes eight distribution panels, five control panels, a direct-current rheostat panel plus a swinging synchroscope. All circuit breakers are oil operated.

Efficient equipment, alone, of course does not fully explain the success achieved at this modern plant. Chiefly responsible for progressive policy and direction are City Manager, C. N. Harper, who also doubles as City Engineer and Superintendent of Utilities; Mayor John Towns and Commissioners E. P. Mason and I. F. Gross. Wayne McCaslin is City Attorney. Added to this list should be the late O. M. Goodrich, who was City Manager at Stockton for 28 years before his death in 1950. On the operation end, much credit belongs to Plant Superintendent Floyd Lightfoot, who has been working with Stockton's engines since 1922. Fred McMichael is Superintendent of Distribution. An example of the sound planning which has gone into this plant is the amount of thought given to such matters as labor utilization. At Stockton, all employees of the distribution department, which maintains 50 miles of 2400-volt line extending two miles beyond the city limits, are trained to handle assignments in at least one other municipal department, whether power,

**An interior view of the Stockton municipal power plant, showing the 840-hp Fairbanks-Morse tri-fuel O-P at left. The remaining four units are also F-M units, including (left to right) a 320-hp Model 31AD8-1/2, dual-fuel unit, a 360-hp Model 32C originally installed in 1930, a 450-hp Model 32E installed in 1947 and a 1920-hp, 720 rpm Model 38DD8-1/2 tri-fuel O-P, installed in May 1955. Together these five engines are averaging a low 3.73 mills per kw hr on fuel.**



Floyd Lightfoot, Plant Superintendent, feels for detonation on the tri-fuel O-P. Mr. Lightfoot reports that this unit will pick up a full load in a matter of seconds without crackling. Also shown are the unit's Woodward governor, Nugent duplex pilot oil filter and Ross lube oil cooler.

water, police or fire. This practice permits greater flexibility, saves the taxpayer's money and promotes efficiency. Stockton is a forward-looking city whose achievements exceed its physical size.

#### **List of Major Equipment Serving 840-Hp & 1920-Hp Fairbanks-Morse Tri-Fuel Engines**

Engine	Fairbanks, Morse 6-cylinder, 840-hp, 600 rpm, Model 38DD8- 1/2; tri-fuel engine, direct- connected to Type TGZO, 735-kva, 588-kw, 600 rpm, 3-phase, 60-cycle, al- ternator with direct-con- nected Type DGZO 7 1/2 kw, 125-v. exciter.
Engine	Fairbanks, Morse & Co. 12-cylinder, 1920-hp, 720 rpm, Model 38DD8-1/2; tri-fuel engine direct-con- nected to Type TGZO, 1700-kva, 1360-kw., 720 rpm, 3-phase, 60-cycle, al- ternator with direct-con- nected Type DGZO, 15- kw, 125-v. exciter.
Governor	Woodward
Pulse generator and	
Ignition coil	Bosch
Fuel oil filter	Nugent
Fuel oil	Sinclair
Lube oil strainer (Full flow)	Air-Maze
Lube oil filter (by-pass)	Fairbanks, Morse & Honan Crane
Lube oil pump	Roper
Lube oil cooler	Ross
Cooling tower	Marley
Float control (day tank)	Levelometer
Exhaust pyrometer	Alnor
Air-intake filter	American Air Filter
Air-intake and Exhaust silencer	Maxim Silencer Co.



# HUGE MOBILE POWER PLANT

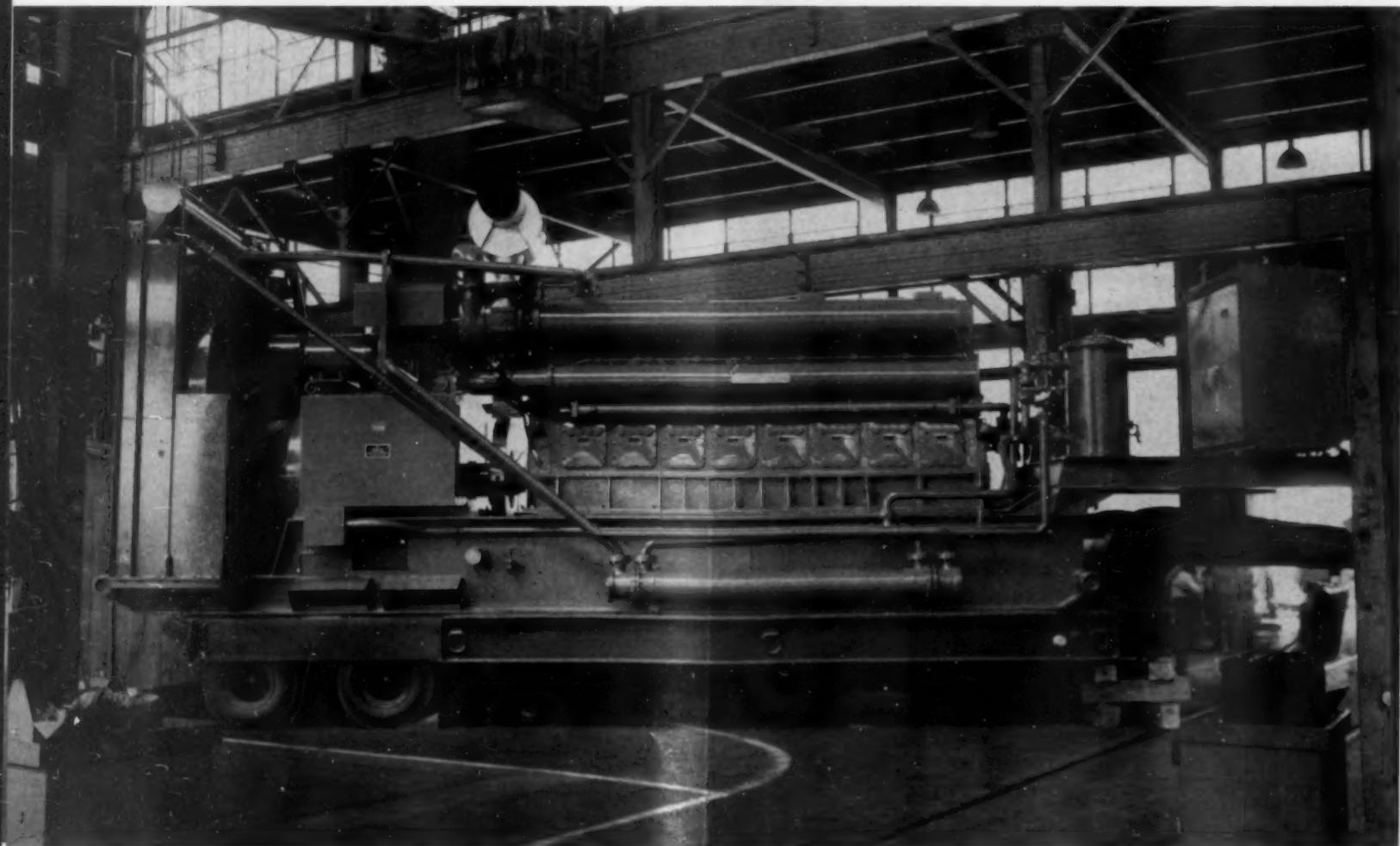
By DWIGHT P. ROBISON

ONE of the world's largest trailer-mounted mobile power plants has recently been shipped to Venezuela for use on a construction project. The 1250 kw diesel generating plant was conceived as a weather-proof package for on-site power at a construction project. It was developed by the White Diesel Engine Division, the White Motor Company, Springfield, Ohio for the Instituto Venezolana Petroquimica (under the Ministerio de Minas y Hidrocarburos) for use at a major construction project in Venezuela. This is the group responsible for development of Venezuela's petrochemical industry under the guidance of the Minister of Mines and Petroleum. All power plant components, including White's Superior 1765 hp diesel engine were packaged for proper distribution of weight. The steel skid structure supporting them takes full advantage of the lines of the 39 ft trailer which carries it. Main components are grouped on the low deck, with controls and auxiliaries riding forward above the

"gooseneck", which rises over the tandem axle of the Autocar truck, which pulls the trailer.

When the power plant rolls onto its location, the Autocar truck can be detached for other uses, and the 16 wheel trailer is levelled to provide a proper operating base for the power plant. If desirable for more permanent use, the package power unit could be snaked off the trailer with a bulldozer, and placed on a level site. Pickup by the truck would then be accomplished by use of a truck-mounted winch, driven by the truck engine. Dimensions of the entire package with trailer are 39 ft length, 10 ft 8 1/2 in. width, and it stands 17 ft high in operating position. "Use of larger mobile power units, such as this highly efficient unit, are a demonstration of the needs of the expanding national economy of Latin American countries", commented Mr. William F. Burrows, General Manager of the White Diesel Engine Division, White Motor Company.

Side View of the 1250 kw mobile power plant. Note from left to right, Young radiator driven off the Ideal generator, Air Maze air filter, Superior 1765 hp diesel, Maxim silencer above the engine, Ross lube oil cooler below the engine, Winslow lube oil filter forward of the engine, and Ideal weatherproof switchboard at the far right.





View of the huge mobile power plant, with standing from left to right, William F. Burrows, General Manager, J. H. Newton, Sales Manager, and John Seagren, Chief Engineer—all of White Diesel Engine Division. Quincy compressor, Nugent duplex fuel oil filters, Woodward governor, and Young intercooler can also be seen in this view.

Underway, the truck, trailer and diesel electric generating plant are an 80 ton combination. The plant skidded off the trailer is a self sufficient 58 tons of equipment. The fabricated steel engine drives a 12 ton generator, and is equipped with an 11 ft square cooling radiator, fuel tanks, filters, a silencer, and other necessary equipment for completely independent operation. The units are combined in a package built to stand without shelter on the series of heavy construction projects that will materialize under Venezuela's public works expansion program. If it would eventually be used in one of Venezuela's growing cities, this package can handle the power needs of a town of 10,000. Purchase of the units is in keeping with Venezuela's lofty position among importers of this country's goods. Although it has only about six million people, Venezuela is the United States' second-ranking customer in Latin America.

There are further design features of this mobile power plant that are worth noting. A 350 gal.

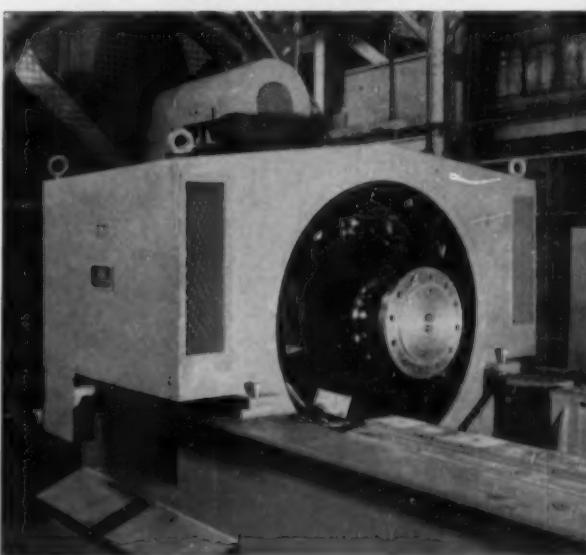
capacity fuel tank is integral with the unit in order to insure continuous operation when fuel tank trucks are being replenished. The engine operates on a non-premium diesel fuel, a decided aid on construction projects which by location would restrict the availability of all grades of fuel. The unit is entirely self contained, including air starting. It could easily be used in parallel with other power sources to augment power needs in any area. The generator is a fully enclosed weather proof type, and uniquely, the radiator is v-belt driven off the end of the generator. The large capacity radiator is split between intercooler and jacket water-lube oil cooling systems. Engine driven water pump is used for latter with electric driven water pump on intercooler, each supplying its circuit from the radiator. The lube oil system contains a full flow filter with intake, outlet, and bypass valves in system enabling operation of the engine if necessary, when filters are being changed. An engine driven lube oil pump handles flow to filters and through the lube oil cooler.

Control of the 39 ft power plant is achieved at the switchboard mounted forward of the engine. One operator per shift can easily attend the diesel. Walkways are conveniently mounted for routine inspection. Power output is taken from insulated terminals on top of the weatherproof electric control panel. Service to driven equipment will be accomplished through separate distribution control panels, as the construction job may require. Use of the power unit at varying altitudes will not hamper operation of the engine. It contains a considerable reserve of power in line with its conservative continuous rating of 1765 bhp. Transport of the unit may be necessary over steep construction roads, but the Autocar truck has been carefully chosen for the job. Proper selection of transmission and power unit insures movement up steep grades. The trend to larger mobile equipment is effectively exemplified in this huge but versatile power plant.

#### LIST OF EQUIPMENT

Engine	White Superior Model 65-SX-8, 1765 bhp at 152# bmeep and 600 rpm.
Generator	Ideal, 1250 kw at .8 pf, 2400 volt, (3 phase 60 cycle).
Switchboard	Ideal.
Exciter	Ideal, 15 kw, 1750 rpm.
Radiator	Young.
Intercooler	Young.
Silencer	Maxim.
Air filter	Air Maze.
Air Compressor	Quincy.
Lube oil filter	Winslow.
Lube oil cooler	Ross.
Governor	Woodward.
Fuel oil filters	Nugent.

Closeup of the Ideal weatherproof generator, top mounted Ideal exciter, and Young radiator with fan v-belt driven off the generator. This unique radiator mounting effects good weight distribution and contributes to a compact power unit package.



# FLORIDA'S TAKE APART DREDGE

By ED DENNIS

FROM Florida comes a unique, newly developed and field tested hydraulic pipe line dredge. It reportedly features the ability to work where other floating dredges can't start to begin. Landbuilding in shallow waters and half submerged patches of mangroves around Florida has run wild in recent years, and where this type of land is not accessible, man made lakes are being dug or dredged up. If these dredging operations continue, Florida will not run out of water front lots for generations to come. On the west coast near Marco, a developer bought 400 acres of half submerged mangrove islands for \$88.00 an acre. It is costing him about \$5,000.00 an acre for dredging operations to bring the swamp land up to six ft above sea level, but the selling price for a 60 x 100 ft lot is \$2,350.00 and up. Another land developer who has an exclusive project being dredged up and developed near South Miami expects his plush lots to bring about \$20,000.00 each.

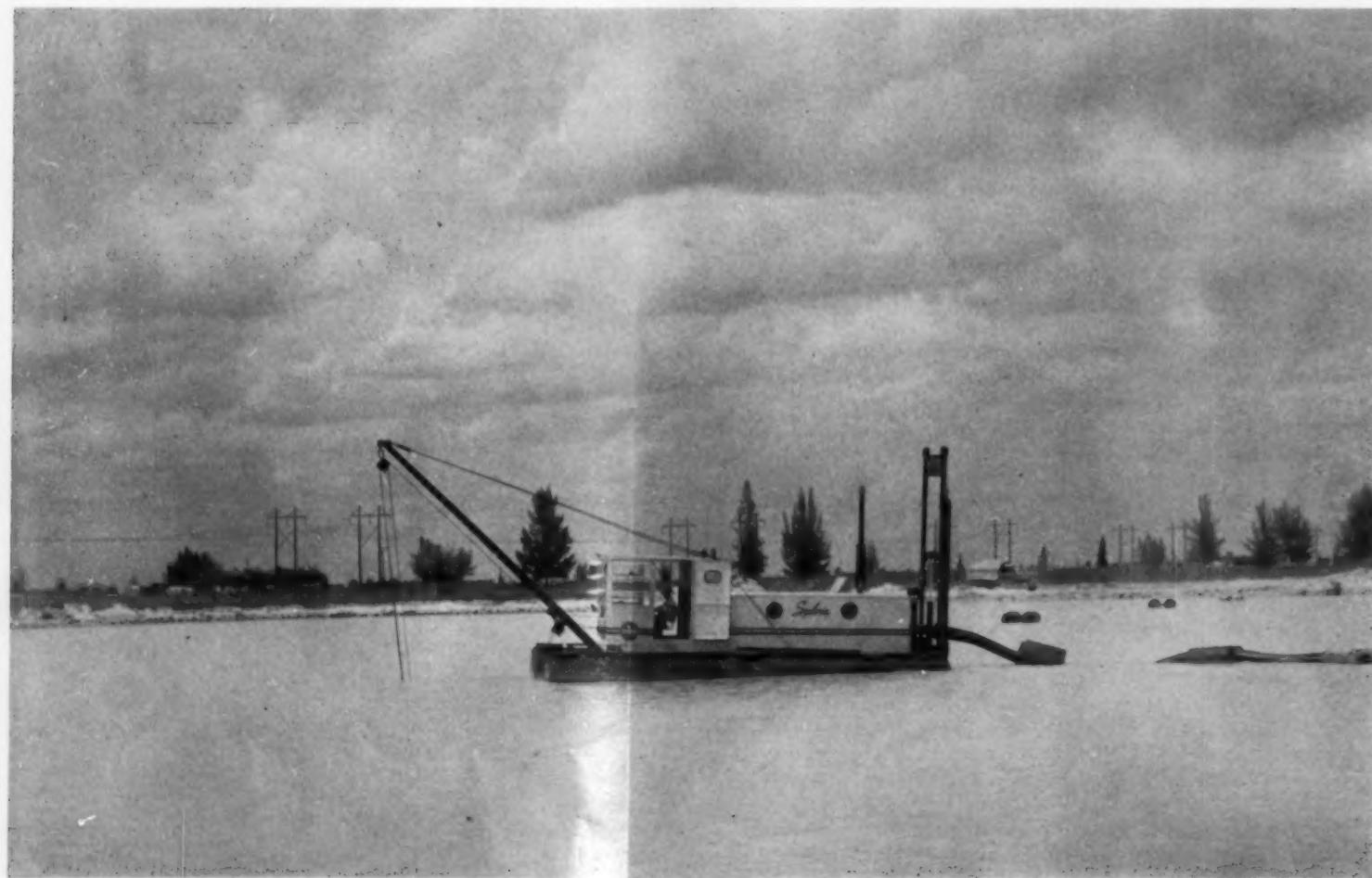
With all these dredging operations going on, John Milne, a sales engineer with years of experience on construction equipment, used his ingenuity and experience to design and build a

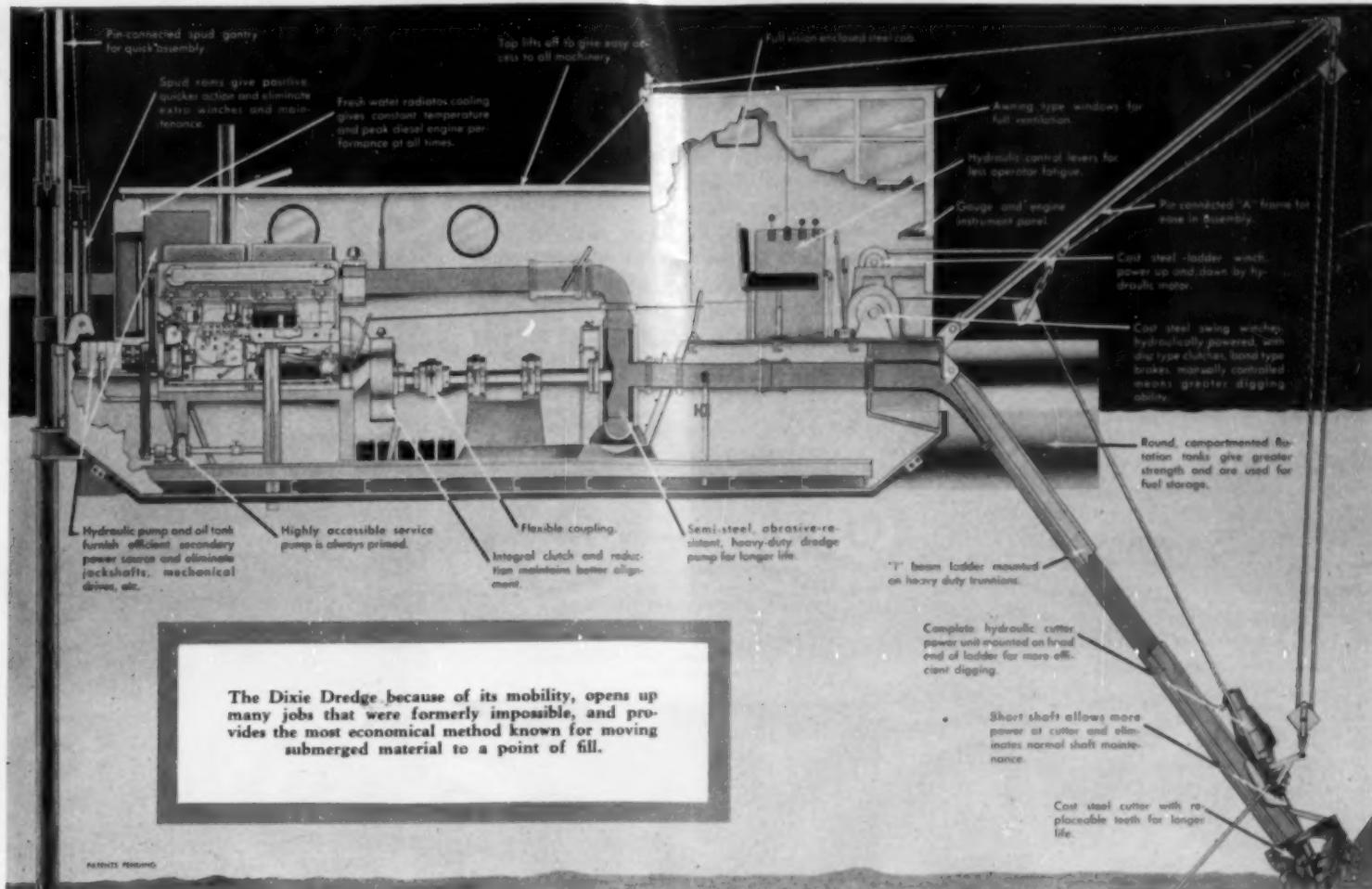
new type portable hydraulic dredge. The prototype proved so successful that land developers jumped at the idea to purchase this new compact dieselized dredge. Now, three years later, a *Dixie Dredge* leaves the Service Machinery Company's shop about every two or three weeks. A complete, self contained unit, the *Dixie Dredge*, needs no auxiliary assistance from the land near where it works. The 8 in. dredge can suck 100 to 150 cu yds per hour, depending on the material, and convey the material up to 2600 ft, or about a half mile, from the point of excavation, for a cost of approximately eight dollars. The larger size, a 10 in. dredge, with more diesel horse power has correspondingly larger work capacity.

One of the unusual design characteristics is the complete hydraulic control for all operations. A 180 hp Allis Chalmers Buda diesel engine supplies power to the 8 in. Maddox dredging pump and the hydraulic pump. The hydraulic pump, which maintains a constant pressure of 2,000 psi, supplies the necessary power needed for the Hydrexo hydraulic cutter head power unit and the other hydraulic accessories. These new portable dredges

are cheaper to purchase and operate than a dragline. Not only is the initial cost of a dredge less than a dragline but it can dig material for about five cents a yard cheaper and needs less auxiliary machinery such as trucks etc., to complete its operation. It, also has the ability to provide thousands of dollars more of sand fill per acre of lake by excavating deeper. When starting to dig a lake, almost anywhere in Florida, all a contractor needs to do is have a dieselized bulldozer dig a hole 7 or 8 ft deep, leave it over night and the next morning the hole will have enough water in it for a small dredge to start operations. The knocked down dredge can be trucked in and then assembled by two workmen without the use of cranes or special machinery in less than two hours and it can be launched with the bulldozer.

A model 6DA-844 Allis Chalmers Buda diesel engine provides a continuous horsepower of 166 at 1800 rpm or a maximum horsepower of 215 if it is needed. The diesel drives an 8 x 8 Maddox sand pump through a direct drive cotta SR12A transmission and a Falk flexible coupling. The diesel's displacement is 844.2 cu in. and they are





being supplied by J. Frank Knorr Company of Miami, Florida. The reinforced stress resistant steel hull is 28 ft long, 16 ft wide and 3 ft deep and is constructed of  $\frac{1}{2}$  in. welded steel plate. It is of the scow type construction with steel runners running the full length of the hull to minimize damage when loading or unloading from a truck or when dredge is being pushed into the water by a bulldozer. Chief among its unique design qualities is that the long drive shaft on the ladder has been eliminated and in its place a Hydrexco hydraulic cutter unit is mounted near the head of the ladder. This with its short power shaft to the cutter head eliminates maintenance problems with misalignment and bearings for the long conventional drive shaft. The weight of the hydraulic cutter unit tends to keep the cutter deeper into the sand.

As good accessories are required for proper operation, we must not leave out the careful selection of proven dependable auxiliary units that are being installed on these dredges.

Donaldson air intake filters.  
De Luxe lubricating oil filters.  
Commercial Fulfilo fuel oil filters.  
American Bosch fuel injection system.  
Delco Remy starters and generators.  
Cotta transmission.  
Harrison radiator.  
Hydrexco hydraulic cutter head and power unit.



# OFFSHORE DRILLING PLATFORM VINEGAROON

**V**INEGAROON, the second mobile off-shore drilling platform to be placed into coastal tideland drilling service, by Zapata Off-Shore Company, was commissioned recently at New Orleans, Louisiana. After formal christening ceremonies, attended by many dignitaries of the oil industry, the 2500-ton behemoth immediately departed for its first drilling site in the Gulf of Mexico. The rig's initial operations will take place 15 miles off of Cameron, Louisiana, where it will drill for Sun Oil Co., in 35 ft of water. The new tripod drilling rig, patterned after its forerunner, Zapata's *Scorpion*, was fabricated by R. G. LeTourneau, Inc., of Longview, Texas, at the firm's Vicksburg, Mississippi manufacturing site. Prior to its christening, the rig was towed by three tug-boats from Vicksburg to New Orleans where final outfitting of the derrick was completed. The LeTourneau corporation served as the contractor for the *Vinegaroon*, with Oilwell Supply Company furnishing the complete drilling rig.

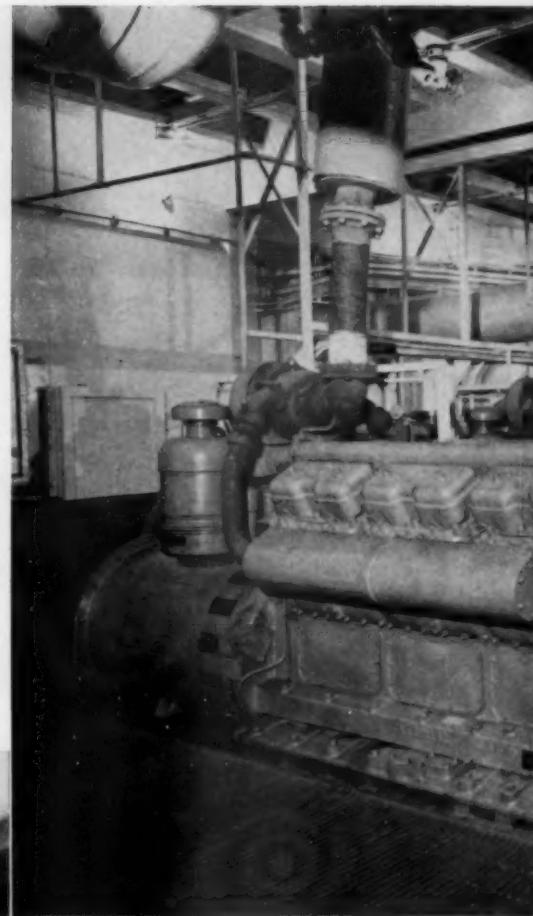
Although similar to the *Scorpion* in basic design, the *Vinegaroon* incorporates changes that its owners believe will afford it even greater mobility than its predecessor model. The *Vinegaroon* is a triangular, floating barge, equipped with three electro-mechanically controlled spuds or legs. The giant legs, each operating in 36 ft spud wells, lower to the ocean floor when located over a drilling site, elevating the hull structure to the desired height above the water. The legs are 145 ft in height, and are made of truss-braced tubular steel, combining strength and rigidity, with the ability to adequately minimize the effect of heavy seas. Three gear racks are mounted integrally on each of the legs, and are driven by final drive pinions actuated by LeTourneau Electric Garmotors. The feet of the elevating legs are spud tanks 35 ft in diameter, and 32 ft high, which are filled with water when the legs are lowered. Having concave bottoms, the spud tanks are designed to provide a sure grip in securing dependable and firm footing on the ocean floor.

Powering the three supporting legs are 27 LeTourneau electric motors, nine in each spud housing, which drive the legs through 6,000 to 1 gear reductions, and derive power from three LeTourneau 440 volt, 60 cycle, 3-phase ac Generators. Power for the generators is provided by three Caterpillar D397 turbocharged diesel engines, set for 600 hp (intermittent) at 1200 rpm. One of these Cat D397 Engine-LeTourneau Generator combinations supplies power for ship's service, as well

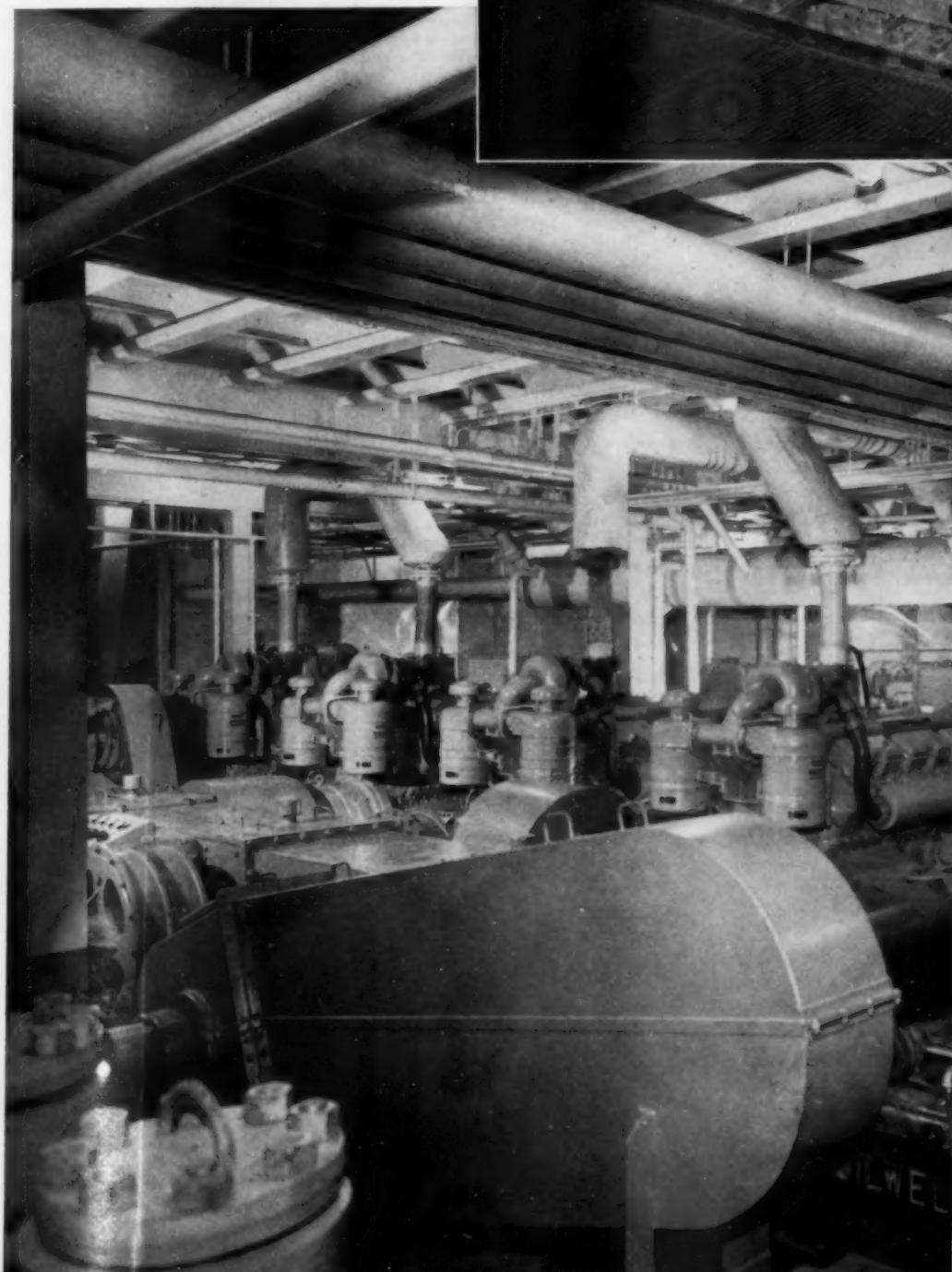
as providing stand-by power for lowering the legs. Sufficient power is supplied by the power equipment to allow all three legs to be raised or lowered simultaneously, an improvement over the *Scorpion*'s capacity to operate only one leg at a time. Fully loaded, the new drill rig may be raised at a rate of 16 in. per minute, and lowered at 18 in. per minute. The average height of the platform above the water during drilling operations will be approximately 40 ft.

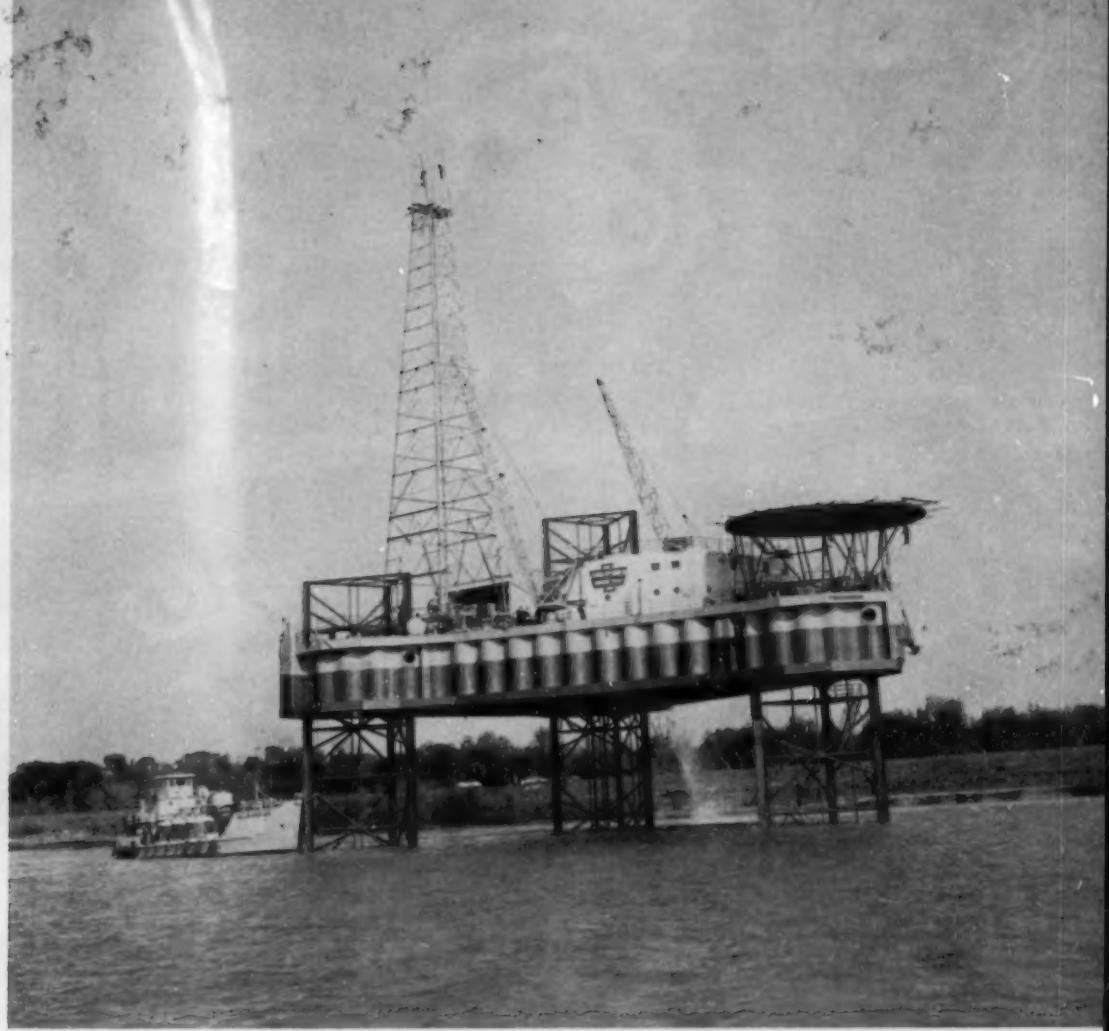
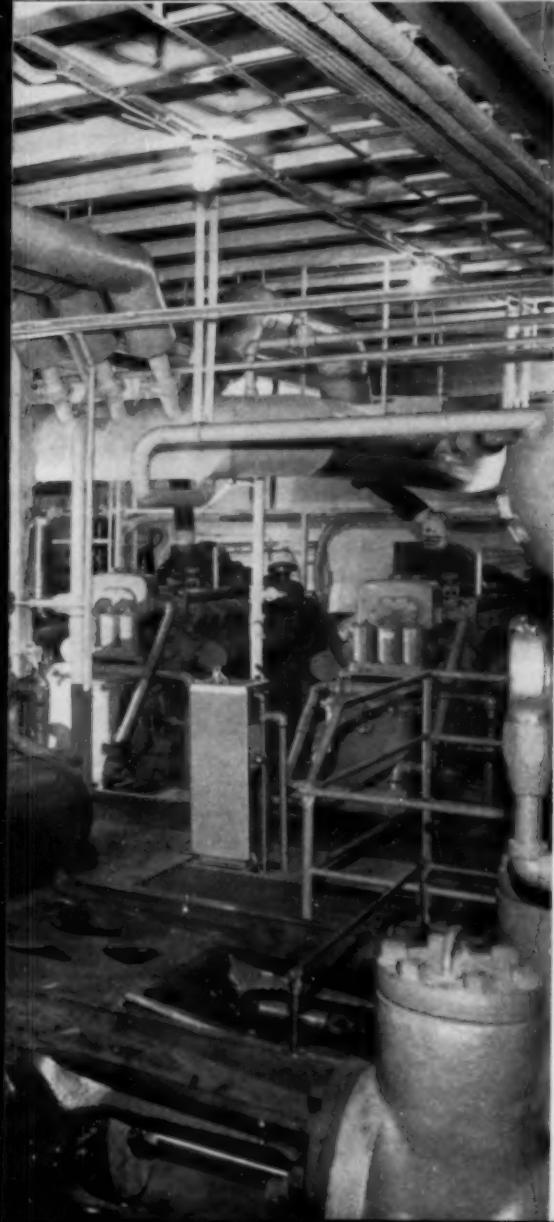
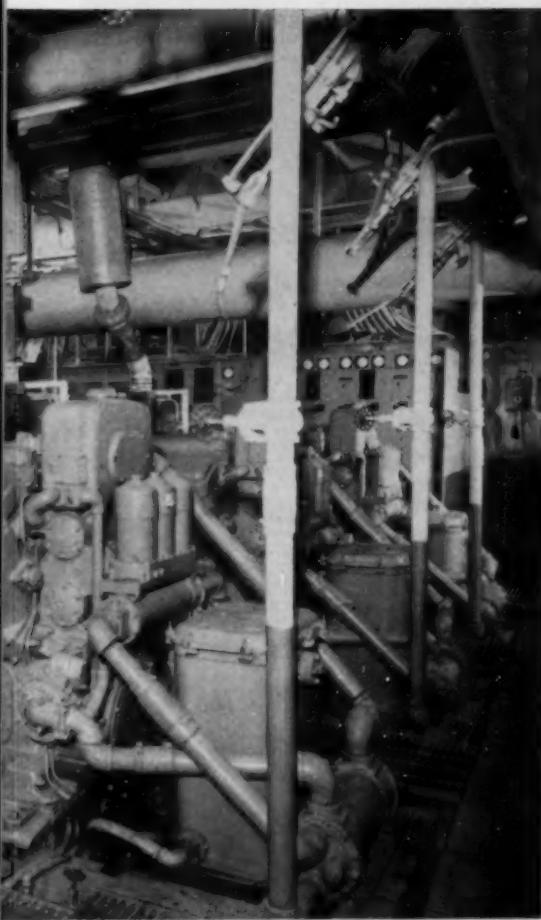
The *Vinegaroon*'s triangular shape is in contrast to the rectangular configuration of the *Scorpion*, a design modification which its designers feel will

Prime power for powering the three supporting legs of the *Vinegaroon* is furnished by these three Caterpillar D397 turbocharged diesel engines, driving LeTourneau 440-volt, 60-cycle, 3-phase ac generators. The engines are rated at 600 (intermittent) horsepower at 1200 rpm. Note AiResearch turbochargers.



All drilling equipment for the *Vinegaroon*, except the catwalks unit, is located in a compact equipment area beneath the barge's main deck. In the background are the three Caterpillar D397 diesel engines, equipped with LeTourneau 440 volt, 60-cycle, 3-phase, ac generators, which power the rig's giant legs and supply ship's service. Also shown are the four Caterpillar D397 diesel engines, equipped with Twin-Disc torque converters, that are mechanically compounded to drive the mud pumps, drawworks and rotary table.





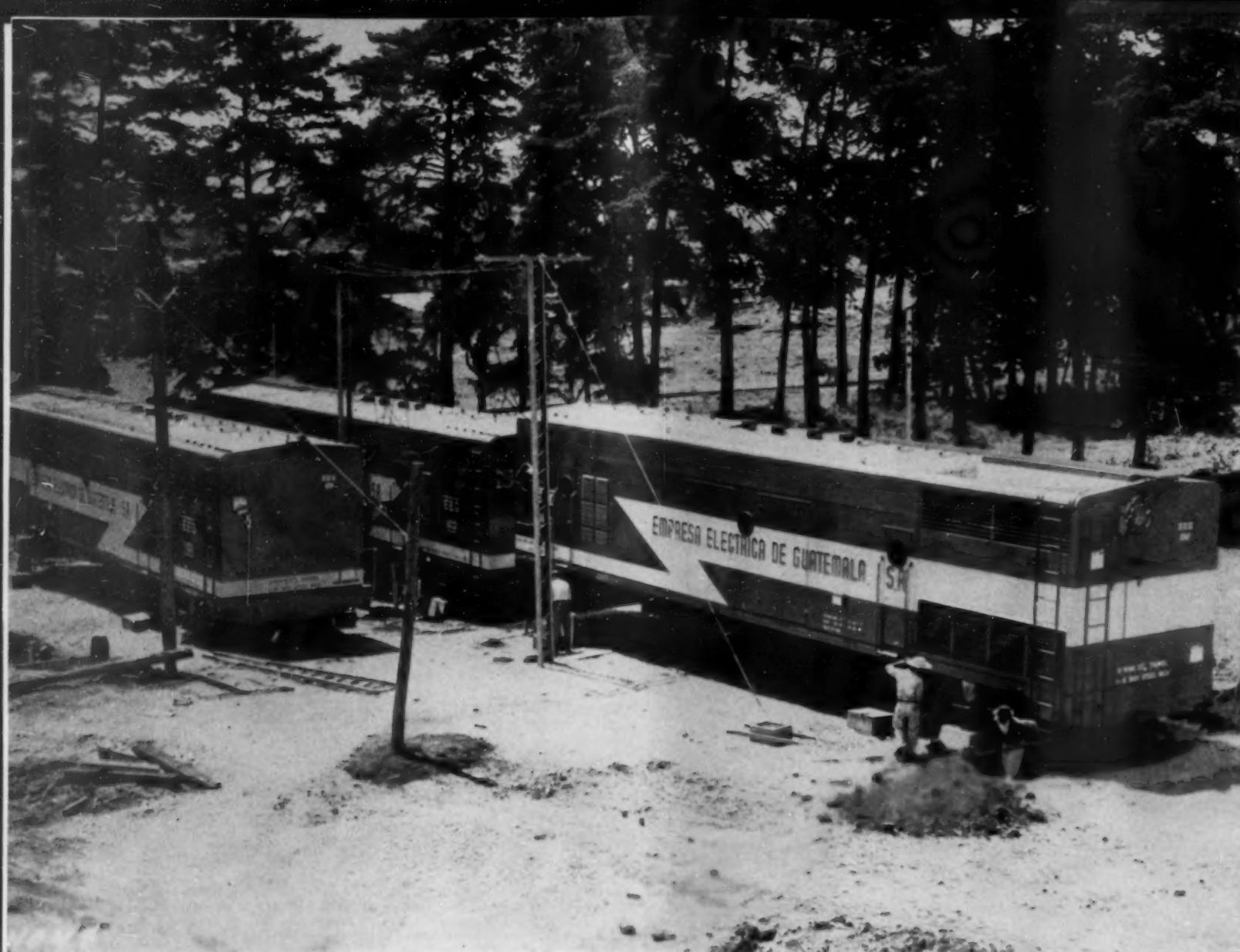
On the day prior to its christening in New Orleans, La., the mobile drilling rig *Vinegaroon* undergoes final outfitting of its helicopter landing platform and 140 ft derrick. The 2500 ton rig, second of its kind manufactured by R. G. LeTourneau, Inc., of Longview, Texas, is owned by Zapata Off-Shore Company. It is presently drilling for Sun Oil Co., 15 miles off Cameron, Louisiana, in 35 ft of water.

afford greater maneuverability when the barge is being moved between drilling sites. The *Vinegaroon*'s platform hull is 176 ft long and 151 ft wide, with a depth of 20 ft. Loaded draft of the rig is 11 ft 6 in. The hull sides and outer bottom are made of corrugated steel. Deck structures and platform inner bottom are fabricated of flanged steel plates. Between the platforms double bottom are arranged compartments for the storage of drilling water, potable water, and diesel fuel.

All drilling equipment, except the catworks unit, is located beneath the drilling platform, where it is protected from the weather. Three mud pumps are located below decks, two having 925 input hp at 65 rpm, and one with 325 input hp at 65 rpm. An Oilwell Model 96 drawworks is also installed in the same equipment area, with cables to the crown block running through an aperture in the platform deck. Prime power is supplied to the drilling equipment by four Caterpillar D397 diesel engines, each generating 520 intermittent hp at 1200 rpm. Equipped with Twin Disc torque converters, these engines are compounded to power the mud pumps, drawworks and rotary table. The drilling platform and 140 ft derrick of the *Vinegaroon* are situated on the rig's stern, and are elevated above the main deck. Equipment located

on the derrick platform includes an Oilwell Model 52-T drawworks for coring, cathead and rotary operations, and an Oilwell control console, which permits complete operation of the entire rig by a single man. An open-end drilling slot allows the derrick and drilling floor to slide back to clear the completed well, when moving off location.

Two LeTourneau 300 foot-ton revolving cranes are installed on the platform deck, aft of the crew quarters, servicing deck and hold areas, and aiding in materials handling. Three anchor winches, each having a 50,000-pound line pull capacity, are located on the platform deck, and are used in positioning and mooring the platform. The quarters and living facilities for the men who will be working the *Vinegaroon* are integrally built into the rig's stern. With provisions for 45 men, these accommodations are located on three levels, and are completely air-conditioned. A control office is located over the living facilities, from which is exercised central control of the platform during elevating, lowering, and towing operations. An inter-communication system connects key locations on the rig with the control office. Rounding out the platform's complete communication system is a short wave and ship-to-shore telephone, also installed in the control office.



First three of seven new General Motors "Electro-Mobile" 1000-kw diesel electric generating units in the process of installation at La Castellana Power Station. All units were recently delivered to "Empresa Electrica De Guatemala," an electric utility subsidiary of American & Foreign Power Company, New York, to protect and improve service to customers in Guatemala City, Guatemala.

## U.S. DIESELS ON THE MOVE OVERSEAS

By DOUGLAS SHEARING

**M**OBILE Diesel electric generation equipment of U.S. manufacture is moving in ever greater quantities into overseas regions. Designed to supply vitally needed power for combating disasters caused by acts of war or nature, rail and highway mobile power units have likewise proved to be invaluable assets in meeting the emergency needs of many countries throughout the world faced with a rapidly expanding industrial program. During the two years since General Motors Corporation announced the development of this new type of mobile diesel electric generation plant, General Motors Overseas Operations has shipped to one major international utility corporation alone, twenty-nine 1000 kw railcar generating plants for power generation abroad.

Applications found to be in particular demand are what utility engineers refer to as "fringe area interim boosting" and "peak skimming." This consists largely of meeting unusual demands for current which are either so seasonal, so temporary or so low in load factor that power distribution experts do not consider it economical to extend either an original power line or a second line for protection. The connection of a mobile power generating unit into the power distribution system at a convenient and accessible location has finally supplied a long-sought answer to this problem. Equally important to power utilities overseas is the efficient, yet economical emergency repair and overhaul of stationary power plants in widely located regions under their administrative control. Mobile power genera-

tion units have now permitted the scheduled rotation of a substitute power source amongst several plants for this purpose while gaining an appreciable reduction in capital expenditure for stationary standby power equipment. There are two models in the "GM Electro-Mobile Power Units" line. One is designed for movement over railroad right-of-ways, the other for movement over highways. The railroad unit is of 1000 kw capacity; the highway unit of 500 kilowatt capacity. For requirements greater than 1000 kw, these industrial units may be rapidly connected in parallel to a common power transmission line so that any desired multiple generating capacity may be obtained. Thus a long train of railroad or highway units totaling, for instance, twenty thousand kilowatts or whatever may be

necessary, can be quickly made available to restore or supplement a city's essential services in the event of any emergency or natural disaster.

Where mobility is necessary but of secondary importance, there are three General Motors models of portable generating plant utilizing the same diesel power generation equipment as is contained in the "Electro-Mobile Power Unit" line. These packaged portable plants of 500, 750, and 1000 kilowatt capacity, are mounted on skids and capable of being placed on railroad cars or truck trailers for transport. All have proved highly adaptable for supplying overseas power requirements of a more permanent nature. In one application a large mining concern installed twelve of these 1000 kw units in a single powerhouse in the Belgian Congo to meet immediate world demand for increased copper ore production. Mr. Henry B. Sargent, President of American & Foreign Power Company and President of EBASCO International Corporation, in a talk before 200 executives of power utility companies throughout the United States on the subject of "The Next Fifteen Years for the American Electrical Utility Industry" stated 'from the personal experience of my associates of American & Foreign Power, these portable diesel electric gen-

erating units have been used to great advantage in many places throughout Latin-America. We have one operation in Brazil where we have had for the last five years, ten 1000 kw G.M. diesel units connected in parallel. While I would be the last one to say this is the ideal way to carry any base load for a utility company, in areas where you can't build lines fast enough or where the cost of a line to serve a peak load can't be justified, these units are very useful. They have run at 80 per cent load factor and have done a very good job. I will say to you that I think we are foolish if we don't take advantage of something that I think can fill a very definite need in the growth and development of all utility companies.'

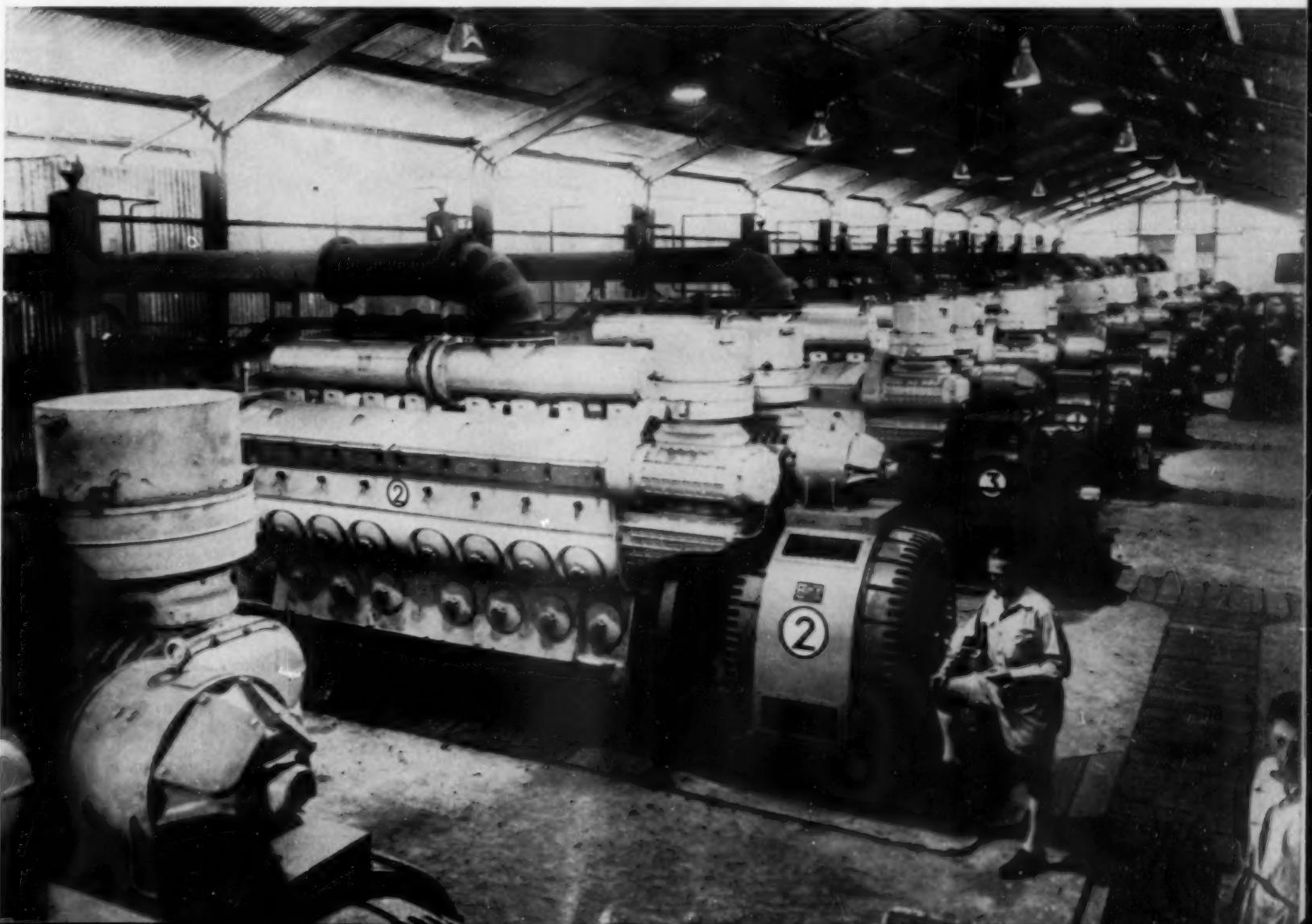
Many major components for all models, such as the diesel engine and its accessories, were already in production for use in General Motors locomotives. Generators and car structures are so closely related to the designs used in diesel-electric locomotive construction that existing production machinery methods and labor at the Electro-Motive Division in La Grange, Illinois, were readily switched to the new product with all the economical benefits gained from a high volume production source. A new line of alternating current generators called

the "A" series was designed for use in these mobile and portable units and features the latest electrical and mechanical advancements growing out of Electro-Motive's experience as a builder of heavy duty electric traction equipment. The "A" line generators are built to operate at 4160 or 2400 volts. Utilizing silicone, glass and mica, these generators have improved insulation, better fitted than any known insulation to withstand the intermittent operation requirement, which is frequently found in fringe area, low load factor situations and extremely varying weather conditions.

An outstanding feature of the "Electro-Mobile" units is availability of automatic control apparatus which makes these units completely self-operating at far outlying points. They can be controlled by a central operator, hundreds of miles away, by impulses over a wire or by radio, or they can be started or stopped by fluctuations in voltage on the line which they are serving. The new units represent a unique offering of power utilities overseas of a completely integrated standardized mobile or portable power plant of a size large enough to meet the rapidly increasing expansion problems of nations facing constructively, the development of their industrial and economic resources.

Twelve General Motors portable power generating plants, each of 1000 kw capacity, help meet the power demand for increased copper ore production at Union Miniere Mines in Panda, Belgian Congo. Power units were readily transported by railway flat-car from a West African port to the selected site and quickly installed.

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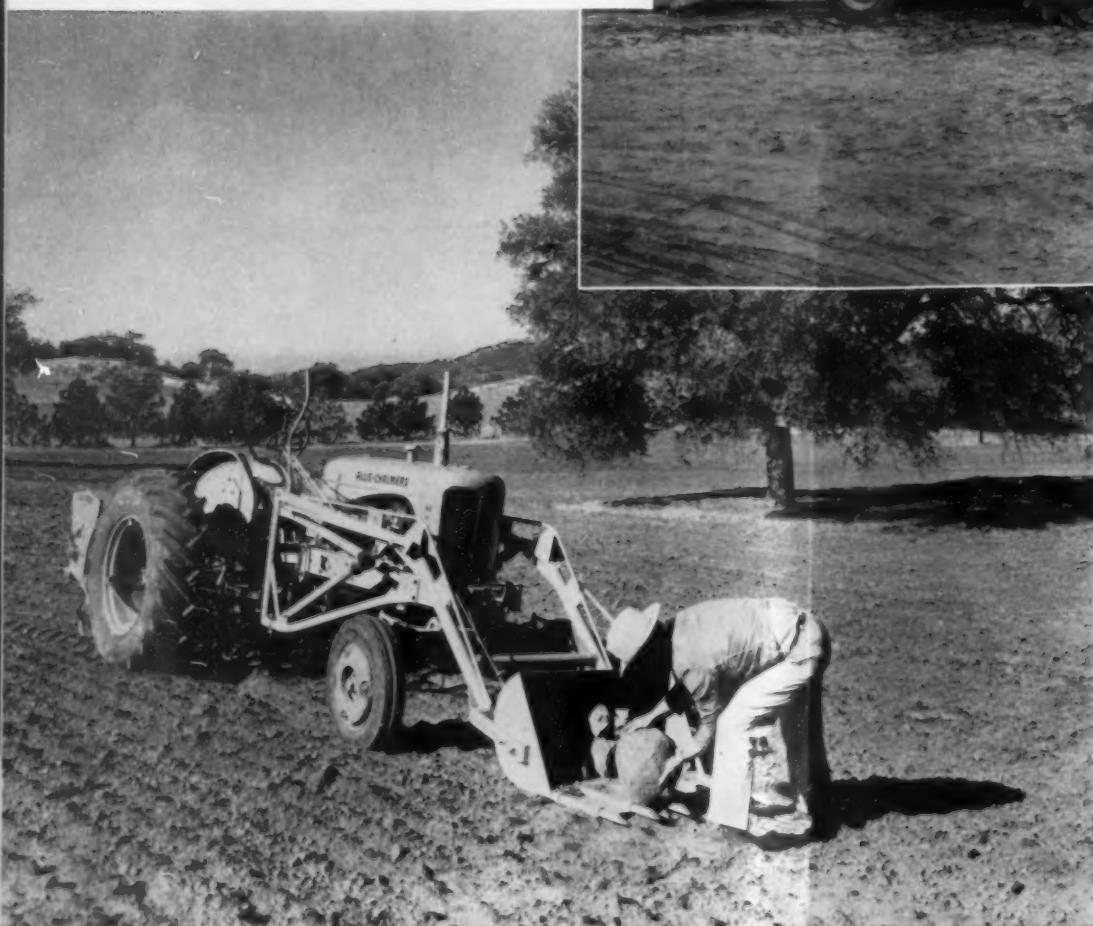
# JOBs FOR FARM MACHINES

By F. HAL HIGGINS

**D**IRT moving in the forms of road and dam building, levelling and other industrial jobs is beginning to make a big shift in plans of the full-line farm machinery manufacturers and their dealer outlets. This fact has been meeting the eye and ear of the writer for some time. Since last November, the writer has attended local, state and national conventions, meetings and shows where he has met old friends in the farm machinery and heavy equipment industries. At Santa Barbara, he attended the annual convention of California farm machinery dealers. At the California Tractor & Implement Club, he has since met three times with manufacturers' western branch officials. At Davis, he has seen the new trends in farm machines exhibited by manufacturers and forecast by the Agricultural Engineering Division researchers who are working out the mechanization of crops like grapes, olives and all the others that must be mechanized to stay in the modern farmer's plans against the competition of crops already mechanized. At the National Road Show in Chicago, he met old friends who have become presidents of world wide manufacturing empires and who are in intimate touch with trends in every area of the earth now being re-shaped and cultivated. The tempo of everything has been accelerated in this post-war era. There are the haves and have-nots to deal with. All are eager to copy and even surpass the mechanized agriculture, road building and resulting prosperity of the U.S.

There are two or three big economic reasons for this shift in targets at this time: (1.) Dirt moving in road building and dam construction, with the necessity of catching and distributing Nature's

bounty for the rising population, is certain to be the big field for diesel engines and their prime movers for the next twenty years; maybe fifty, eliminating a war that could abruptly halt it. (2.) Every tractor manufacturer has his line of diesels ready on wheels or tracks. All have been increasing the jobs their mobile diesel equipment can do on farm and industrial job by adding easy and quickly attached and detached front power scoops, shovels, backhoes, bulldozers, snow plows, winches, etc. The buyers are demanding more such attachments to permit their operators to use the tractor more hours per year to increase use of tractor throughout year and keep both family and hired labor busy and earning. (3.) The farm tractor was here first. It was the farmer who worked out the tractor to the practical point after which it was adapted and adopted by industry for many jobs—road building, logging, pipe line laying,



Minneapolis-Moline has had out a line of wheel diesels for several years and now announces crawler tractors to carry diesels as well as L-P and gas power aimed at more of the industrial field including road and street construction, dam and pond building, land levelling, and all such year-round chores that crawlers have been doing between farm crop seasons. Here is an M-M diesel with backhoe and front shovel.

Rolling Diesel gathers rocks! Allis-Chalmers WD45 doing two jobs at one pass over fields to point the way for more industrial work between seasons for this farmer.



New combination 2-row lettuce bed cultivating idea introduced by Ashton opens up another Oliver wheeled diesel tractor field in the famous lettuce bowl of the Salinas Valley. The front-mounted cultivator is a Chatin rotary job, and the Oliver rear toolbar and chisels bring up the rear for the best cultivating of lettuce beds in the Valley.

etc. So, with a full line of sizes, many tractor manufacturers have been in industry for years. They merely give the road and dam building high priority now that agriculture is in a post-war slow down.

In checking on two historical moves by two of the full line manufacturers of machines, much of the big news of announcements of what these mergers mean is still to come. The J. I. Case Co. has concluded the deal to acquire American Tractor Corporation, which has already developed an annual business of nine million dollars, according to reports. By now, said two Case officials from Racine and California branch, "Case will be in the big dirt moving industry with plans to match other lines of crawlers. This Terratrac organization is alive, ambitious and will go places," said Branch Manager Bill Carey, who has just returned from headquarters and a meeting with the American Tractor Corporation's top management. Case has been doing a good business with its wheel tractors in industrial sales for some 20-odd years since organization of this department. Hence, the company has considerable acquaintance with tractor power sales and service outside of the regular farm field.

The second big farm machinery manufacturer that has made a major move that puts it into the international trade is Deere & Co. In the purchase of the famous old German Lanz company, Deere acquired one of the best names in the European field with years of diesel development for both farm and industrial work. This is one of the fruits of Deere's new president's long views ahead. Bill Hewitt, who stepped up to this



John Deere 820 Diesel pulling eight sections of drag harrow behind No. 1 harrow drawbar.

post scarcely a year ago from management of the San Francisco branch, came out of World War II and into the farm machinery industry as a local Ford branch man. He has the western viewpoint on the place of crawlers, diesels and farm and industry continually re-powering to cut costs and keep ahead of economic squeezes. Deere is one of the concerns that over the long pull is always well managed, according to Elmer Baker, Sr., now in his mid-90's as dean of the farm

machinery trade press. And, the Deere crawler tractor is already well established in some areas for "farmer logging" as well as for many chores around ranch, construction jobs like pond building, terracing, etc.

Among the new attachments, accessories, tools and machines seen on 1957 models in exhibits or out on the jobs: (1.) More power in bigger and better diesel engines set in heavier chassis to stand

"Styling" of tractors as to both color and "New Looks" has taken hold in every factory. Here is the new case 300 diesel with a 4-H farm girl expressing approval of what she finds at a Case demonstration.





Farm tractors with front attachments fit nicely into farm woodlot and pulp logging, according to officials at the Pacific Logging Congress. Ford pioneered many of these industrial uses of tractors by cooperating with manufacturers of attachments to make the tractor power do many jobs aside from the traditional drawbar power for plowing.



Unimog—Daimler-Benz German tractor recently tested at the University of Nevada.



International TD24 mounting a LeRoi compressor on rear for rock and paving drilling or other air power jobs. The mounting of drills on crawler tractors for quick and easy moving on mine, highway and other jobs is the modern trend that permits a big shift of young men from farms and ranches where they have become tractor wise to move into heavy construction at high wages as operators of diesel tractors. Some million farmers have shifted since World War II ended, many going into heavy construction where they can quickly earn a stake to buy a home or get into fringe contracting or sub-contracting.

up to industrial work, which is more rugged than farm work. (2.) More comfort and safety for the operator. Skilled men are scarce and high priced. They draw \$2.35 an hour on tractors and trucks on dirt moving jobs on the Pacific coast. With big tractors and trucks worth up to \$52,000 and more each, it is important to keep them going at top efficiency at all times. This influence is spreading from the big crawler manufacturers through the wheel tractor builders. (3.) All tractor manufacturers are following the big crawler industrial trend in adding track type tractors where they didn't have them before. Minneapolis-Moline appeared at the Road Show with a crawler. Deere adds to its two sizes built under the old Deere name with a line from Germany in the Lanz, recently purchased. That leaves only Massey-Harris, Ferguson and Ford without tracks, and the latter wears tracks as the "County" in Great Britain. (4.) More carry, lift, push, pull and "stomp" jobs via new attachments to permit one man on a tractor to work more hours per day and days per year are coming up from contractor, farmer, logger, pipe line builder and dirt mover. (5.) Higher costs in man power have made hand work of hired labor in every field impractical. Hand labor on forks, spades, shovels, saws, axes is too costly to hire. It has not only "priced itself out of a job," but better yet, priced itself onto a machine to permit the laborer to earn more and live on a higher standard.

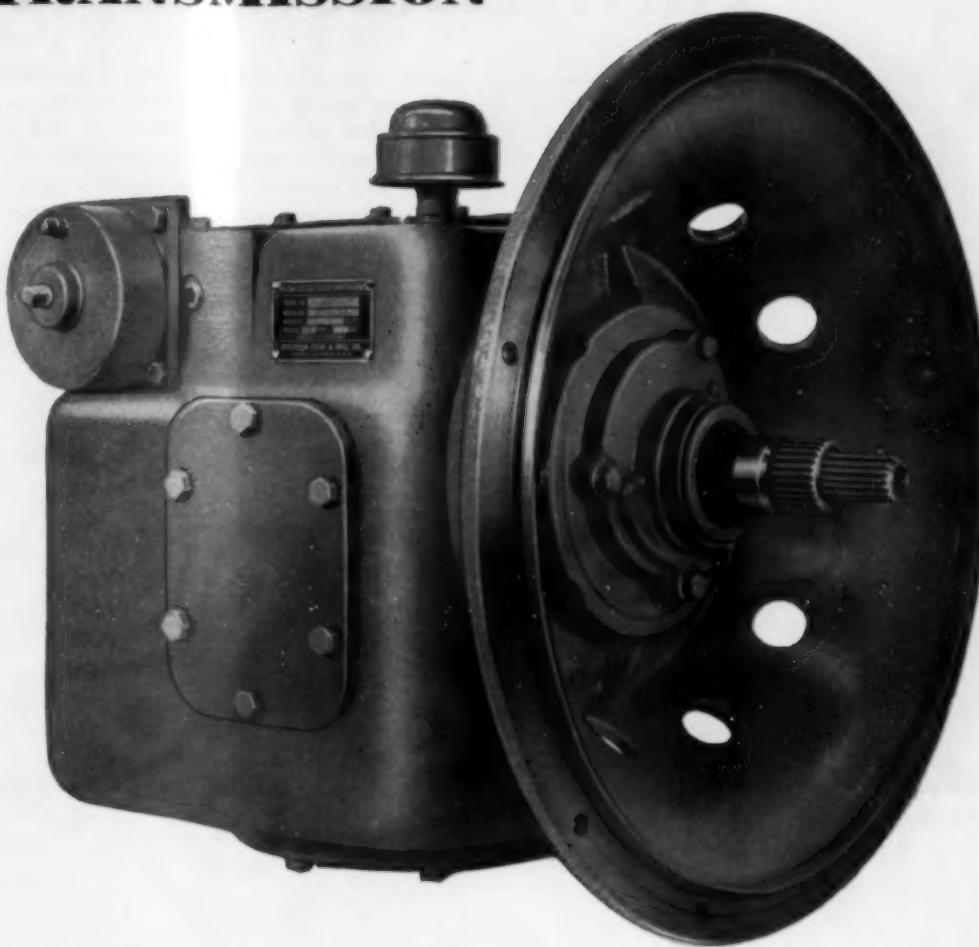
All the farm tractor builders were at Chicago for the National Road Show. And all had a full line of attachments and machines to give their tractors a lot of jobs in the industrial field. Scrapers, front lift loaders, power brooms, back-hoes, trenchers, winches, dozers. Everything the big crawler lines had for road building, the smaller farm wheel tractors also had in sizes and weights to match, and all well designed by specialists in the industrial fields over the years. There are literally scores of little shops over the map from California to the Corn Belt and on down into the South and East that are building special industrial attachments for one or more of these old lines of tractors.

# AMERICAN GEAR'S PLAN GEAR TRANSMISSION

A NEW transmission development for diesels has been announced by American Gear Div. of Brad Foote Gear Works. Designated the Plan Gear Transmission, this unit is designed for use with high speed diesels in heavy duty vehicular and industrial applications. It is a hydraulic transmission of the compound planetary type. The transmission consists of two planetary systems for low and reverse plus a multiple disk clutch for direct drive. The transmission has two speeds forward and one speed reverse, although adaptations can be made for two speeds forward and two speeds reverse. The transmission presently in production has a capacity of 150 to 200 lb ft input torque. Forward and reverse ratios vary with specific applications. The transmission is compact and rugged in design and construction. It measures only 12 in. high, 10 in. long, and 10 in. wide. In the accompanying illustration of the transmission components, the compact, rigid construction of the transmission is evident. The planetaries are actuated when hydraulic pressure contracts a band around an annulus or drum to provide the desired movement. Bands are returned to open positions by spring pressure.

As the operator moves the manual control from, for instance, low to reverse, hydraulic pressure is switched from the low planetary to the reverse system. Pressure overcomes the force of the reverse planetary spring and closes the band as the oil is forced out from between the band and the drum. At the same time, as the hydraulic pressure in the cylinder of the low planetary band is relieved, its spring opens the low band. The hydraulic pressure can be switched at any speed, at any time, to any position; to start, to neutral, or to vary the speed of direction. This is done practically instantaneously—1.5 seconds for change of speed or direction. As the transmission is completely hydraulically controlled, it is only necessary to move the single hydraulic control lever to accomplish this, with no clutch pedal needed. The control lever, because it is part of a hydraulic system, can be located anywhere on the equipment that is most convenient, remotely from the transmission.

Some other features of importance are worth noting. This transmission is lubricated from the inside out, for the most effective lubrication. The



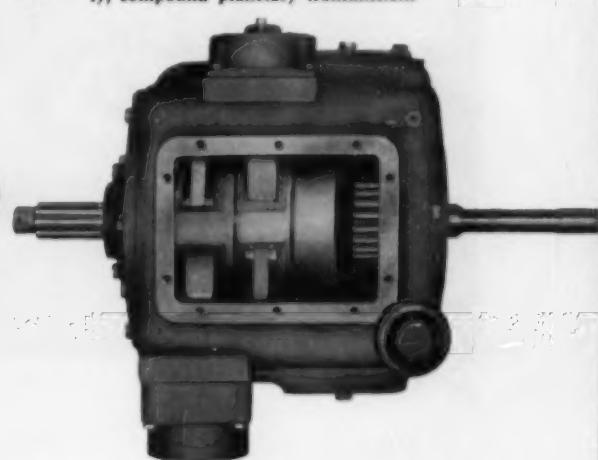
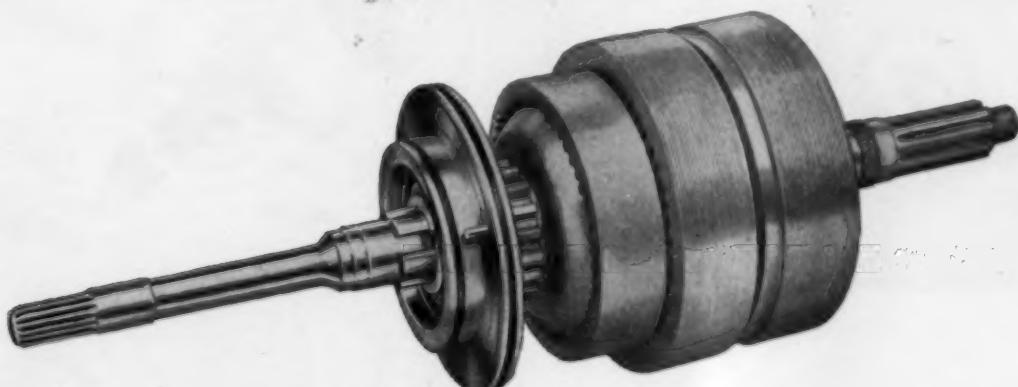
center shaft of the transmission is hollow and lube oil flows through this shaft and out and up through passages in the transmission members grouped around this shaft. This insures full lubrication in all phases of transmission operation. The transmission is completely self lubricated. The lubrication is positive pressure fed from 30 to 60 psi. The transmission is very suitable for use with a hydraulic torque converter, and when used with a convertor, it uses the same common oil system with the convertor. Two power take off apertures, one on each side of case, are capable of transmitting up to one third of maximum output.

American Gear Division has plans in the near future to build larger sizes of this transmission; one transmission with a capacity of 600 lb ft input torque and an even larger one to take up to 1200 lb ft input torque. This transmission has been designed specifically for heavy duty industrial applications. Its good performance characteristics, excellent flexibility and its compact, rugged construction features make it a highly interesting transmission development for industrial and vehicular applications with diesels.

The interior transmission components fully assembled on the input and output shafts. From left to right: 1.—input shaft, 2.—hydraulic clutch actuator, 3.—multiple disk clutch for direct drive (high), 4.—planetary gear assembly for low speed, 5.—planetary gear assembly for reverse, 6.—output shaft. Note the clean and compact arrangement of the components, and how they combine to form a very rigid assembly.

Top view of the Plan Gear Transmission without bell housing and with top cover removed shows the bands and the compact arrangement of this completely self-lubricated, constant duty, compound planetary transmission.

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# INTERNATIONAL HARVESTER ANNOUNCES FIRST TURBOCHARGED DIESEL

INTERNATIONAL Harvester's Construction Equipment Division has announced a new turbocharged diesel—the 265 hp, less fan, Turbo-torque UDT-1091. This engine is a turbocharged version of the well known IH 6 cylinder industrial diesel with a bore of 5½ in. stroke of 7 in. and a displacement of 1091 cu in. This development represents International's entry into the production of a turbocharged diesel engine. The Construction Equipment Division disclosed that the new turbocharged diesel unit attains the 265 brake horsepower rating at 1,500 rpm. This is an increase of 50 hp over its naturally-aspirated counterpart, the UD-1091, previous top horsepower unit in the International line of 18 power units.

This new engine is equipped with an exhaust gas driven AiResearch model C-60 turbocharger, which moves 60 per cent more air through the big 14 in. diameter air cleaner. This big boost in air supply to the cylinders results in a decrease in fuel consumption and higher power with lower exhaust gas temperatures. The turbocharger is well matched to the engine so that optimum performance is obtained over the entire range of engine load conditions, and the turbocharger installation on the engine is clean and compact. Other outstanding features of this new engine include all-weather

gasoline starting system, twin plunger injection pump and pre-cup type combustion chamber for clean combustion of low cost #2 fuel oil, and a water cooled oil temperature stabilizer. The radiator has been enlarged to increase cooling capacity, and the engine is equipped with aluminum pistons with ni-resist top ring band.

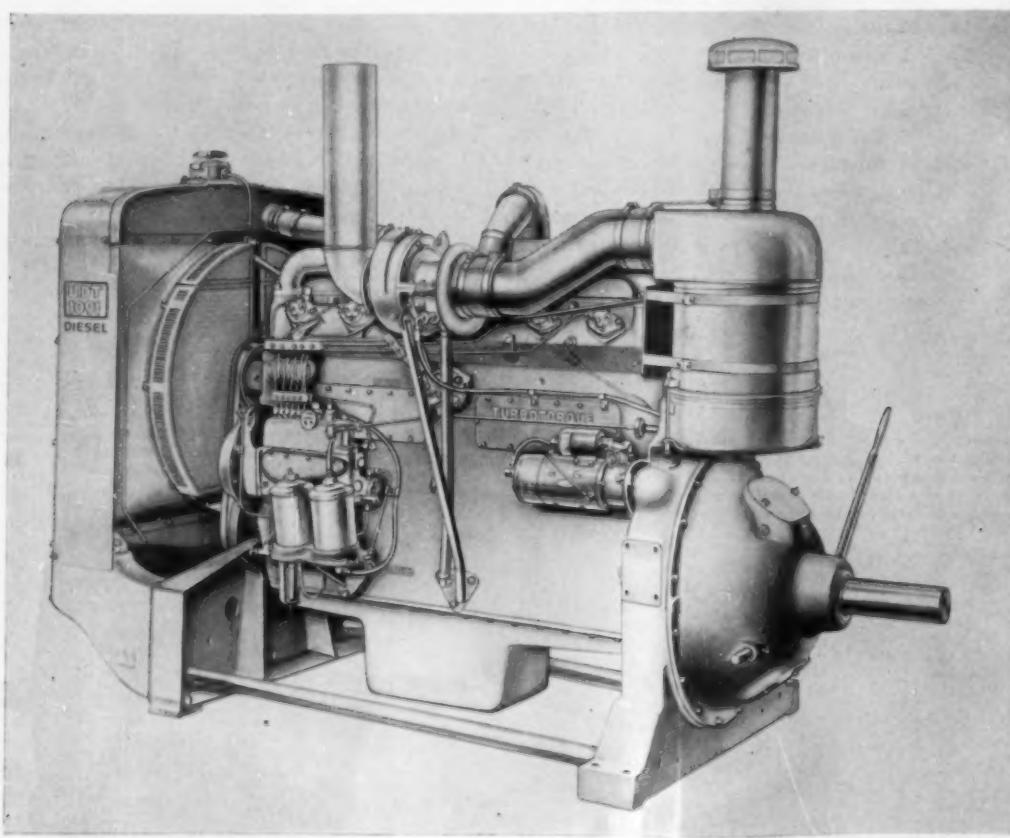
The power curve illustrated gives the rating of the UDT-1091 on an intermittent basis without fan, a maximum of 265 hp at 1500 rpm. As stated above, with fan installed, the intermittent rating of the engine, is 250 hp at 1500 rpm. The continuous duty rating of the engine is 200 hp at 1,500 rpm. An extra-large counterbalanced crankshaft and heavy flywheel assure stall-prevention at the instantly-available 250 hp peak output.

One of these UDT-1091 diesels has been in operation for over two years (over 2500 hours of operation) powering a Cedarapids rock crusher in an asphalt pit south of Durango, Colorado, known as being the toughest crushing area in the state. Giving some of the details of this application will point up the operating advantages that have been achieved with turbocharging. This crushing installation, owned by Northwestern Engineering Company, operates to set and crush  $\frac{3}{4}$  in. minus

asphalt material. A Cedarapids 2540 primary crusher is fed by truck and reduces pit run material to approximately 4 in. minus. The material is then fed to a Cedarapids Master Tandem for the finish cycle. The Master Tandem is producing 130 tons per hour of finished material, and is powered by the IH turbocharged UDT-1091 diesel. Leonard Pont, operator on this spread says of the engine's performance, "I never had power like this on any crusher before. She just plays with the load. I wish I had a larger plant."

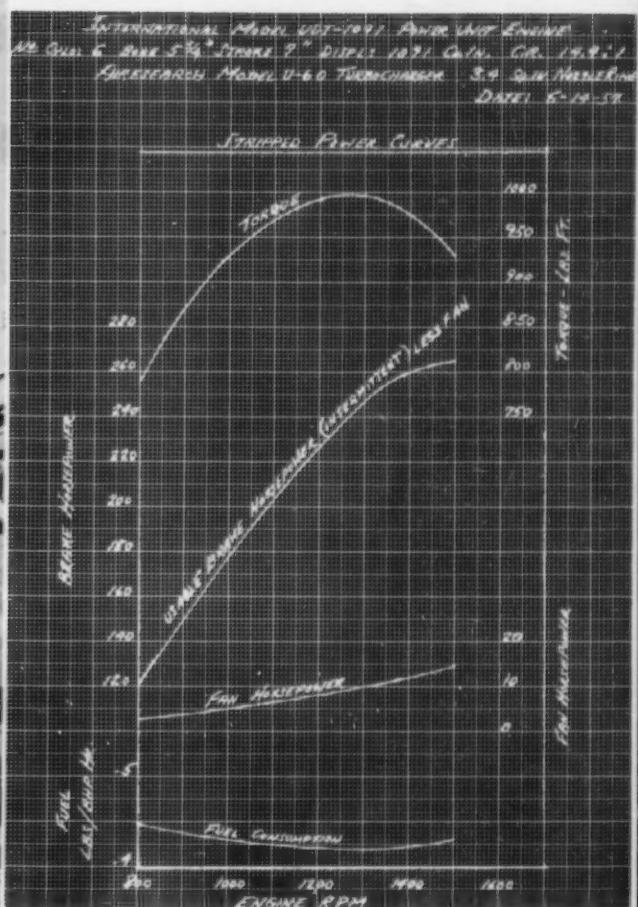
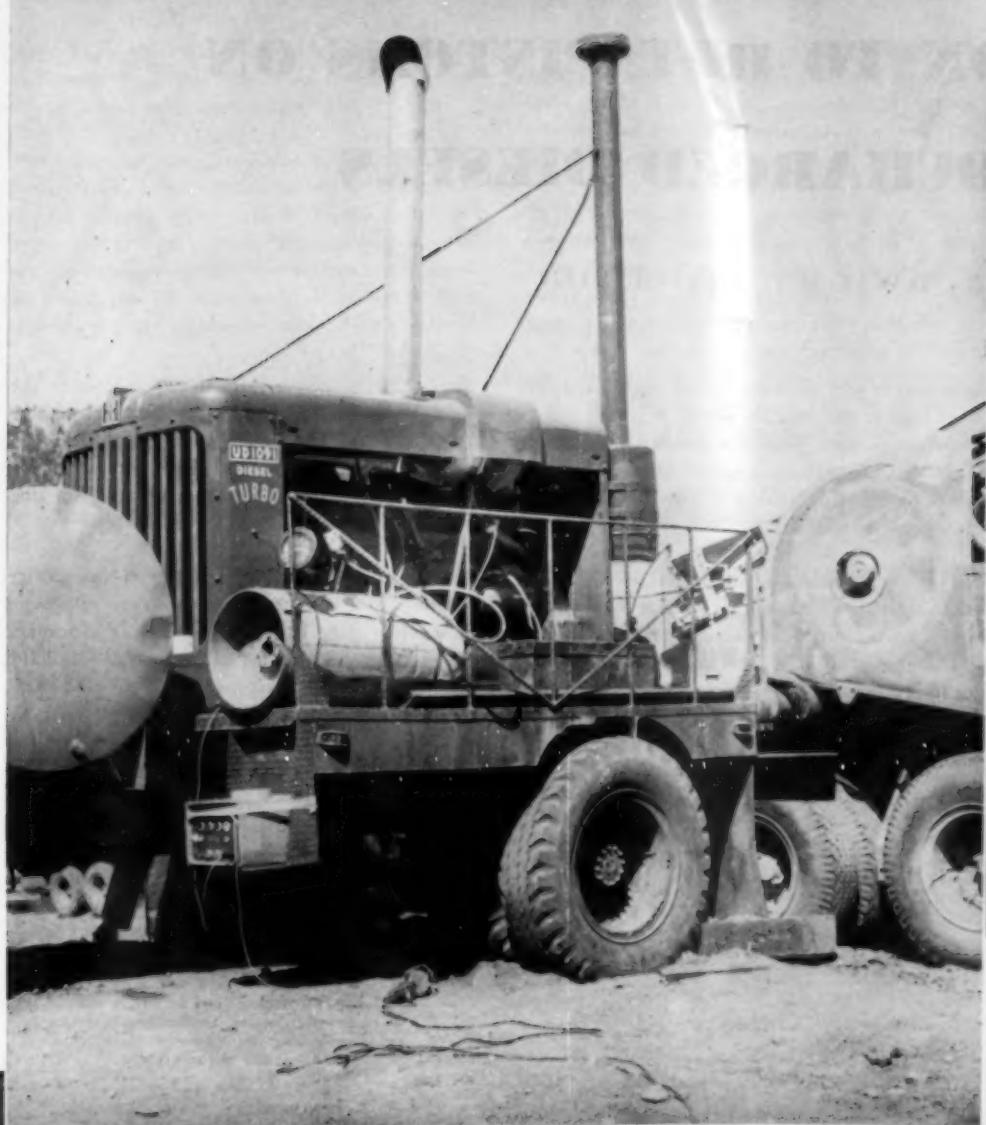
This installation is located at a high altitude, but the turbocharger, by supplying the engine with excess air, gives it the ability to maintain sea level power and efficiency at this high altitude, and also contributes to smoother and more efficient combustion. International engineers report exceptionally low fuel consumption for this engine—as low as .43 lb/bhp/hr. Exhaust temperatures are 200 degrees lower than a comparable naturally aspirated engine and a considerable increase in lube oil and lube oil filter life has been noticed. These are all plus values of this well designed and matched engine-turbocharger combination, above and beyond the increase in horsepower output obtained.

New 250 hp turbocharged IH model UDT-1091 diesel. Note AiResearch turbocharger as installed cleanly and compactly on the engine.



DIESEL PROGRESS



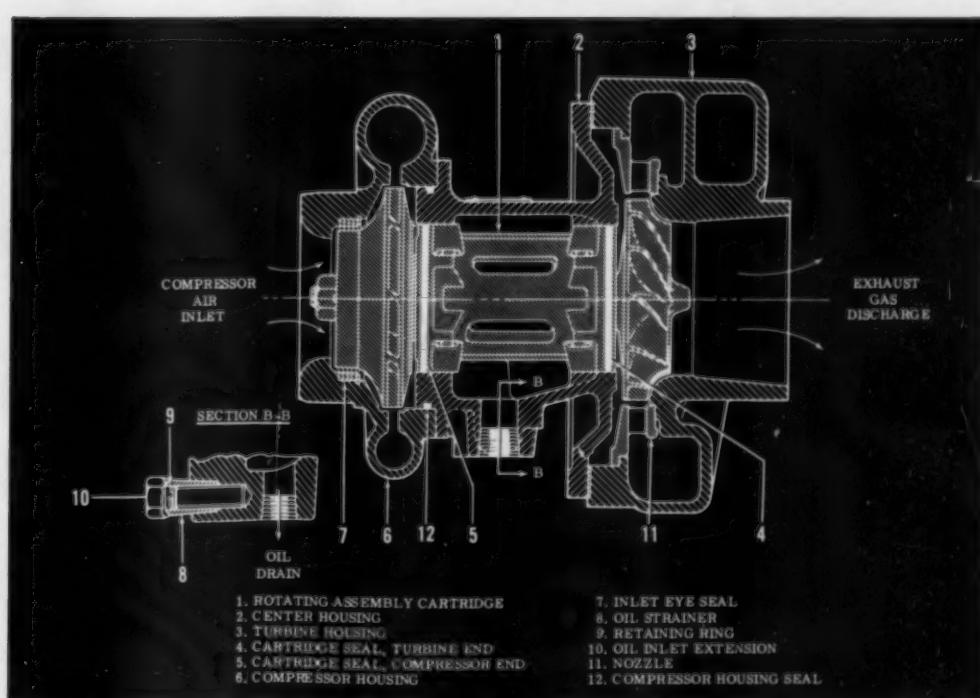


Stripped Power Curves of the UDT-1091 diesel. Note the high torque of this engine.



Above and left—views of the turbocharged UDT-1091 diesel installation in the Cedarapids crushing plant of Northwestern Engineering Co. near Durango, Colo.

Cutaway view of the AiResearch model C-60 turbocharger used on the UDT-1091 diesel, with component parts identified



# A SOLUTION TO HOT PISTONS ON TURBOCHARGED DIESELS

By DWIGHT P. ROBISON

THE problem of piston survival in heavy duty engines has become increasingly acute with the demands for higher speeds, shorter strokes and greater BMEP. This trend has removed the light-weight piston from an area of reliability to one of marginal operation, and indicated the necessity of incorporation in the piston design, features that would resist effects of excessive temperature.

Higher compression ratios, fuel injection and other basic characteristics of the diesel engine requires a new design concept due to the high load and heat factors encountered in the piston head area. Now, with the recent wide-spread adoption of the

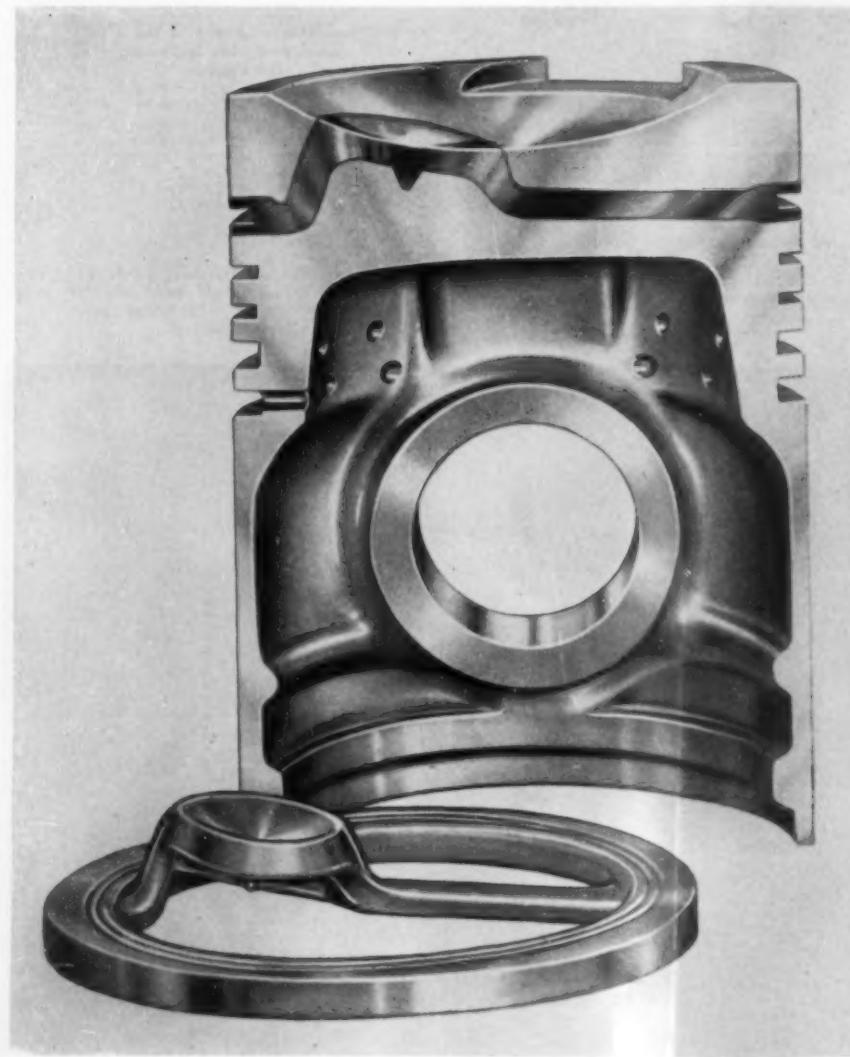
turbocharger as a means of increasing the output of an engine, the troubles arising from increased temperatures have been compounded, and it is found that the features designed to resist the effects of higher temperatures are not only desirable, but absolutely mandatory.

One of the principal results of excessive piston temperature which has been a consistent source of trouble to the engine operator is accelerated top ring groove wear. It is an unfortunate characteristic of aluminum alloys that they become quite plastic at elevated temperatures, which permits the top ring groove to enlarge under repeated ham-

mering of the piston ring, to a point where the top ring fails functionally or physically. The DUALOY piston originally designed and developed by United Engine and Machine Company has proven to be a means of combating top ring groove wear.

In this piston, advantage is taken of the greater hardness and heat resistance of ferrous alloys by integrally casting within the head of an aluminum piston, a ring of ni-resist cast iron into which the top ring groove is machined. This ni-resist insert is chemically bonded to the aluminum by the Al-Fin process to hold it securely in place, and has the added advantage of permitting greater heat transfer so that the top ring transmits its share of the heat to the cylinder wall. Because the cast iron insert is bonded, a ferrous alloy of high thermal expansion is required to reduce thermal stresses between the cast iron ring and aluminum.

Cut-away illustration shows ni-resist cast iron "hot-spot" cast integrally with ring insert, before and after bonding.



"Hot-spot" piston, used in single orifice, direct injection engines to counteract effect of impingement of injector spray on piston crown.



Type 1A ni-resist fulfills this requirement as its coefficient of thermal expansion closely parallels that of aluminum piston alloys.

The ability of this chemically bonded top ring groove insert to contain the effects of detonative erosion has been found to limit the damage to the piston and prevent extensive damage to the cylinder walls and cylinder head which can result when the piston, rings, or lands break off and are thrown around violently within the combustion chamber.

The inherent erosion resistance of ni-resist suggested another application. The single orifice, direct injection diesel engine has been notoriously hard on piston crowns. The combination of localized heat, and the impingement of the injector spray on the piston head has caused severe heat checking and erosion. To counteract this effect, a steel plug has been mechanically employed to protect the piston crown in the vulnerable area; however, the cost of the plug, additional machining operations, the assembly time to bolt and weld the plug in place made it an expensive item. Furthermore, it did not always "stay put".

Using the techniques developed for production of the DUALOY piston, it has been possible to produce a piston able to withstand impingement of the injector spray by using a ni-resist insert in-

corporating a plug held in proper position by spokes. Thus the operator is offered at a substantial savings, the combination of resistance to head erosion and top ring groove wear in one integrated piston.

In the redesign of pistons to allow for the ni-resist cast iron insert, consideration was given to maximum temperatures and stresses throughout the entire cycle. Heavier bosses and thicker wall structure anticipated temperatures and loads that are well within the range of safe operation of the engines being built today. Every application using their ni-resist cast iron insert has improved engine performance and prolonged piston life.

It would seem, however, that the immediate answer has already been provided by the piston industry with the modern design principle of the bi-metallic chemically bonded piston, not new, but modern—as successful bi-metallic chemically bonded pistons have been in heavy duty operation since 1948.

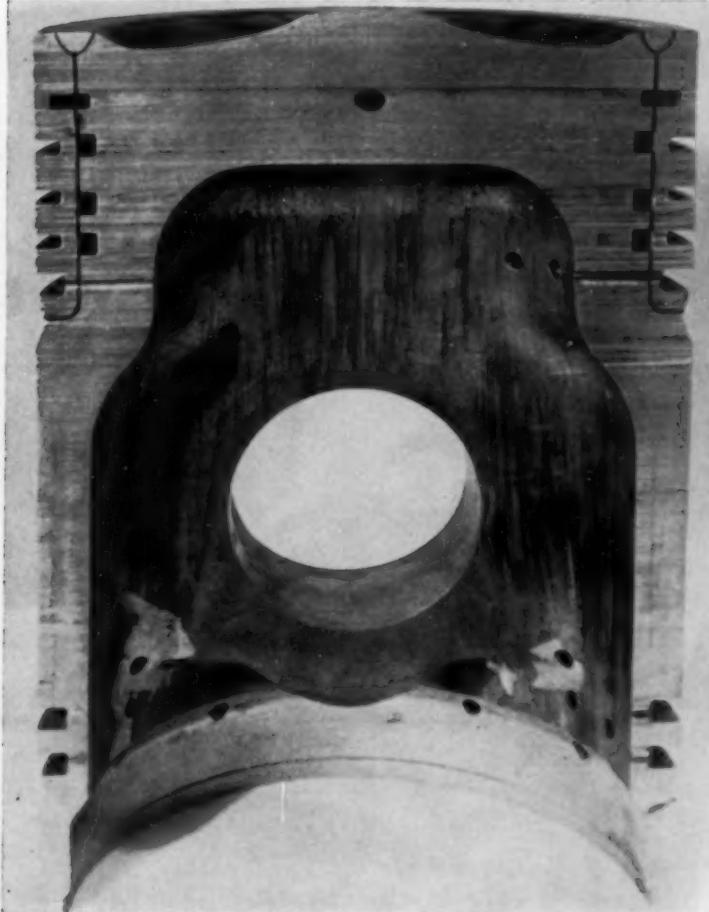
Fuel injection systems are perhaps the most precise

and critical component of a diesel engine. Their present reliability is the result of many years of quality control and exacting manufacturing methods. They are precision made, skillfully assembled, and subject to rigid inspection.

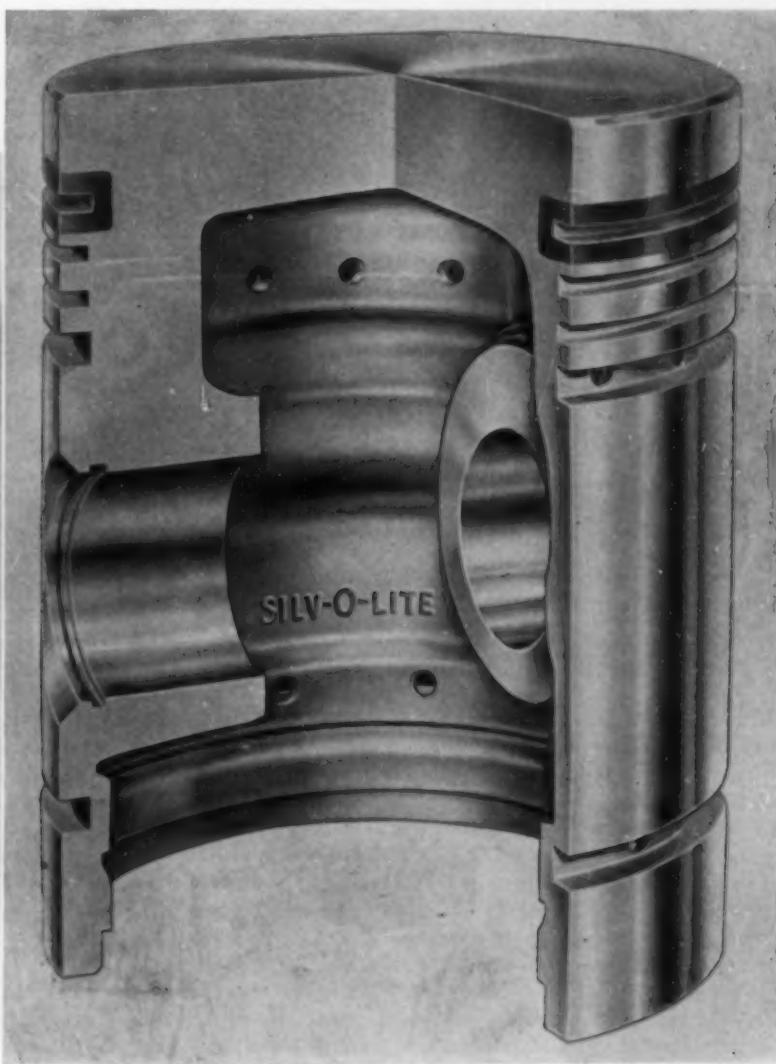
A heavy duty piston is a far cry from the delicate mechanism of an injection system, yet—the technique required to obtain a perfect molecular bond between aluminum and ni-resist is the only positive assurance of the dependability of an integrated and integrally cast unit. Modern technology has not replaced the human skill and know-how necessary to produce bi-metallic chemically bonded pistons. Perfect bonding requires precision timing, skillful casting, and the patience of craftsmanship, and the better bi-metallic chemically bonded pistons that can claim molecular bonding are made by this method.

The limitations of metals and the hazards of excessive heat will continue to be a challenge to the automotive engineer. Whether the solution to the problem will be found in a piston or a cooling system is a question only the future can answer.

Combustion cup piston head design with chemically bonded insert.



Heavy duty bi-metallic piston. Thick crown, wall structure and bosses to accelerate heat transfer.



# NEW DETERGENT-ACTION DIESEL FUEL

By DOUGLAS SHEARING

**A** NEW diesel fuel having detergent and anti-rust properties has been developed by California Research Corp., research subsidiary of Standard Oil Company of California. According to Standard engineers, the new Detergent-Action fuel prevents deposits and rust from forming in diesel fuel systems, acting in much the same manner as Detergent-Action Chevron gasolines. By keeping diesel injectors clean for extended periods, Detergent-Action diesel fuel will maintain clean exhausts, high power and low fuel consumption characteristics of new injectors.

The heart of a diesel is its fuel injection system. Any accumulation of dirt, rust, or fuel gums on precisely machined, close fitting injector parts, adversely affects engine performance. Engine manufacturers and petroleum suppliers have long

residues when exposed to elevated temperatures in the presence of oxygen. Such conditions exist in the injector of an operating diesel engine. The tacky, oxidized fuel deposits adhere to injector parts and can cause plunger sticking, nozzle hole plugging and leakage past critical valve seating surfaces. Standard Oil's Detergent-Action diesel fuel was designed to take care of these problems.

Following the development and marketing of Detergent-Action gasolines, it was a natural step for Standard to look into the possibilities of developing a Detergent-Action diesel fuel. Laboratory tests had established that detergent properties could be incorporated into diesel fuels. To prove the fuel in actual usage in the field, almost four million miles of road tests were conducted, including tests at widely scattered locations to check

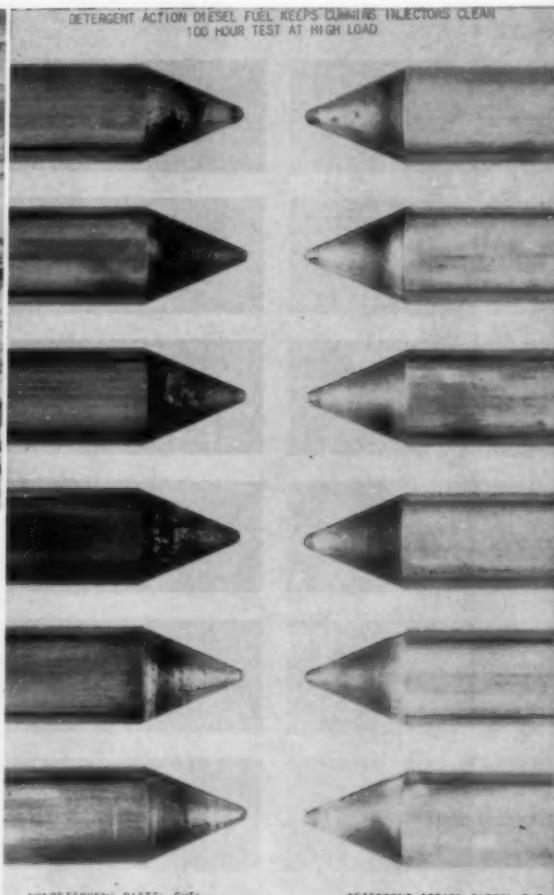
will not remove previously formed deposits, this fuel will keep injection systems clean indefinitely. The action of the fuel on critical injector parts is to continually wash the parts with fuel that has the ability to disperse any deposits that may form. (2) By keeping injectors clean, exhaust smoking with the new fuel will stay at reduced levels for longer periods of time. (3) By maintaining spray holes open and free of deposits, combustion will be improved, resulting in reduced fuel consumption and more power. (4) Clean injectors require less frequent replacement, hence, customers will realize decreased injector maintenance costs. (5) The improved rust prevention properties of the new diesel fuel insures customers against costly rust damage to fuel systems in diesels.

An added plus to these features is that because of its dispersing properties, the new fuel will directionally improve fuel system filter performance. The new fuel has the same storage characteristics as conventional fuels. It has no tendency to increase gum formation in storage nor will it cause increased emulsion problems. The Detergent-Action fuel is available at no increase in price at Standard bulk plants and truck service stations throughout the West.



recognized the importance of providing diesels with clean well-filtered fuel. Reasonable care on the part of diesel operators in fuel handling and filter maintenance practices will practically eliminate injector problems resulting from dirt and foreign contaminants in the fuel. Rust and gums or lacquer which form in place on injector plungers, check valves and in spray holes are not taken care of so easily. Rusting inside injectors can occur during the off-season when equipment lies idle. Operating engines may encounter rust if the fuel contains even small amounts of water. Most petroleum products will form gummy, insoluble

on the performance of the new fuel under a variety of operating conditions. The Consumers Oil Company of Los Angeles used Detergent-Action diesel fuel in its fleet of tank trucks for 14 months. Results showed that after 60,000 miles, trucks using the new fuel produced only half as much smoke as trucks operating with non-detergent fuels. Injector maintenance costs also were reduced. Test runs with giant off-highway diesel trucks carrying heavy loads at the Bagdad Copper Corp. near Prescott, Arizona, brought similar results. Standard Oil has summarized benefits and advantages of this new fuel as follows: (1) Although it



# FLOATING YARD ENGINE

By ROBERT J. FRITH

**B**RITISH Columbia forest products people worked with some diesel engineers and tug boat men to produce what some of them have called "a strange new piece of dieselized marine equipment" for log boom men. It is a sea going yard engine, herds the big timbers into and out of log booms, and assembles them for towing to the lumber mills. In addition, it bundles the smaller logs for more economical handling.

This little craft is variously named. It is so very new that as yet there is no unanimity as to what term will be most generally used with which to describe it. But today it is variously known as the *Eager Beaver* or the *Log Bundler* and by any of these or other names it would do its stuff as well. The little scow-like boom boat measures 32 ft long by 16 ft wide, and it sits on top of the water as lightly as does a seagull. It will float anywhere that a log will float and, because of the power of its diesels it is sometimes propelled up on to a boom of logs, to work with its winches and hoists.

Its creators designed it for beachcombing salvage logs and for parking booms of logs in their appointed places, pending their towing to pulp and paper mills, lumber mills, pile driving companies. Besides riding herd on log booms and rescuing strays, the long bundler is used at times to tow other craft off a lee shore, or even haul as much as 10 tons of logging equipment on its broad deck. S. Madill Limited, of Nanaimo, B.C., built the first of these interesting little craft of  $\frac{1}{4}$  in. steel plates, with some  $\frac{1}{2}$  in. plate at points of special stress. There is a one-foot taper at each end. They housed the propellor in a full length tunnel, so the *Log Bundler* can climb over a log or logs. It



is virtually unsinkable, being completely watertight; water can not reach the engine inside.

At first these little craft were powered with gasoline engines. Later, they were re-powered with diesels. The diesels most frequently used are Cummins or General Motors diesel engines. The Cummins diesel selected is a Model JN6, delivering 96 marine hp from its six cylinders. The General Motors diesels best suited to the little craft is the

Series 71, 2 cylinder model, delivering 55 marine hp. Some other models are also used to power the *Log Bundlers* or *Eager Beavers*. For all of them, speed is not so important, but moving from one log boom ground to another, they can travel at close to 8 knots. There is no steering wheel. A hydraulic pump does the steering. Engine controls are by one lever, set on a dashboard. This controls both throttle and clutch, with compulsory idling for changing from ahead to astern.

The *Log Bundler's* principal assignment is to salvage logs that went astray in a storm, and to open and enter booms and there bundle smaller logs with steel bands so these will not be lost in a high sea. This method effects a great saving in insurance rates. The craft are now manufactured by S. Madill Ltd, 62 Departure Bay Road, Nanaimo, B.C. Diesel engines are supplied by Cummins Diesel Sales of B.C. Ltd, supplying Cummins diesels and by Hoffars Ltd, supplying General Motors marine diesels. Both supply houses have their head offices in Vancouver, B.C.

With winch and hoist, and its own power, the *Eager Beaver* can hustle any boom of logs where it has to go, or handle logs singly, bundling the smaller logs for safer shipment by tow tug.

39



## Distributor History



Ross Stewart



Joe Manning

Stewart & Stevenson Services, Inc., commenced as an off-shoot of the original parent firm of C. Jim Stewart & Stevenson operating as the Engine Division of the parent company until February, 1945,

at which time the Stewart & Stevenson Services partnership was formed. Initially, operations were confined in the plant on Harrisburg Avenue in Houston, but with the steady growth and acceptance of S & S products and service, it was not long before branches were established in Corpus Christi, San Juan, Dallas, Lubbock and finally Odessa.

With these branches and increasing distributorship franchised territories, the need arose for additional resident servicemen and salesmen as well as dealers in key centers throughout the state. The result was that Stewart & Stevenson extended its operations throughout the entire State of Texas (excepting the extreme western tip,) as well as to certain bordering counties in New Mexico. In addition, the export and military business has

resulted in the installation of S & S equipment through many parts of the world.

Principal fields of industrial operation are all phases of oil well drilling, including offshore operations, cotton gins, irrigation, municipal lighting, saw mills and marine operations, both as the latter applies to the fishing industry as well as to vessels used in offshore drilling and commercial towing. Various branches of the U. S. Military Service use S & S diesel driven generator sets for jet starting, auxiliary lighting, fire control, radar and guided missiles. Recent specific developments and improvements of S & S are the Rigelectric electric power package with a new simplified control arrangement for drilling rigs, sand and hydrofracturing units, Red Head Turbine Pumps and Vertical Engine applications.

Officers and Directors of Stewart & Stevenson Services, Inc. are: Ross Stewart, Chairman of the Board;\* J. Donald Stevenson, President;\* Joe Manning, Jr., Vice President and General Manager;\* Leonard O. Carlson, Vice President and Treasurer;\* C. Jim Stewart, Vice President and Secretary;\* Miss Madlin Stevenson, Director; Mrs. Aileen Langham, Director. \*Also Director.

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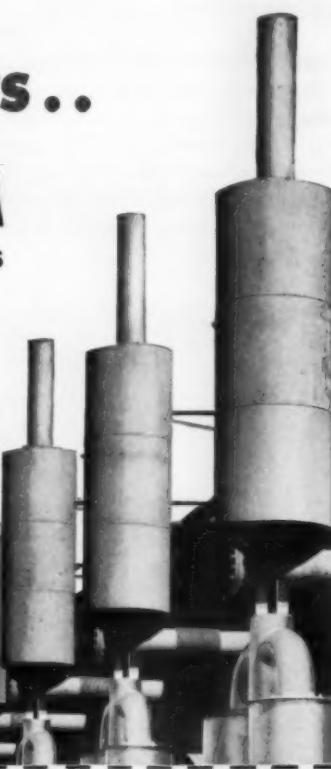
INTERNAL COMBUSTION AND STEAM ENGINE EXHAUST AND INTAKE     AIR COMPRESSOR INTAKES AND DISCHARGES     VACUUM PUMP DISCHARGES

BLOWER INTAKES AND DISCHARGES     STEAM, AIR OR GAS DISCHARGES     JET AIRPLANE ENGINE EXHAUST AND INTAKE

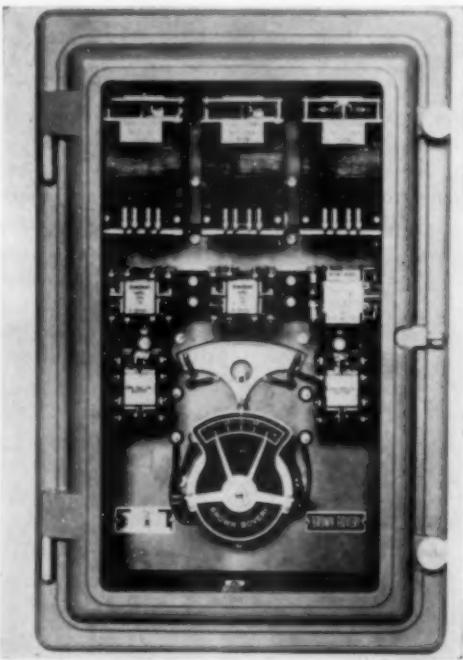
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### Automatic Synchronizer



Brown Boveri Corporation announces the introduction of a fully automatic instant Synchronizer for fast, automatic speed-matching and synchronizing. First, it automatically matches the speed of the generator to the system. When the frequency difference is .5 cycles or less (which limits paralleling shock), the Synchronizer computes the proper lead time to activate the breaker so that its contacts will make at the exact instant of phase coincidence and paralleling occurs instantly without the necessity of actually holding synchronism. The Instant Synchronizer uses no tubes or transistors, and under severe operating conditions, may remain set up for hours without risk, according to the manufacturer. Complete information can be had by writing Brown Boveri Corporation, 19 Rector Street, New York 6, N. Y. **ITS NEW**

# TURBOCHARGER BY THOMPSON PRODUCTS



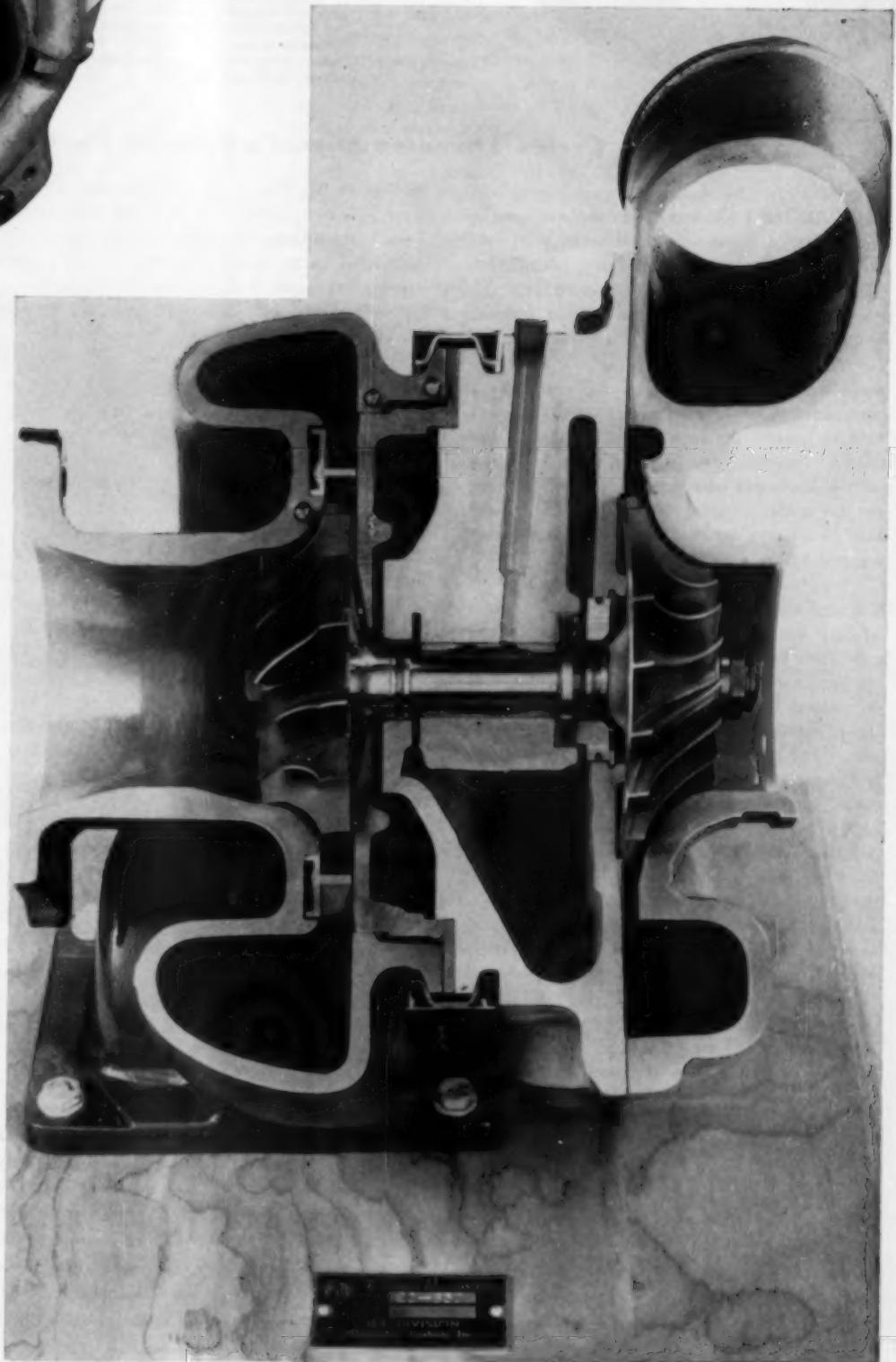
By W. L. BODE

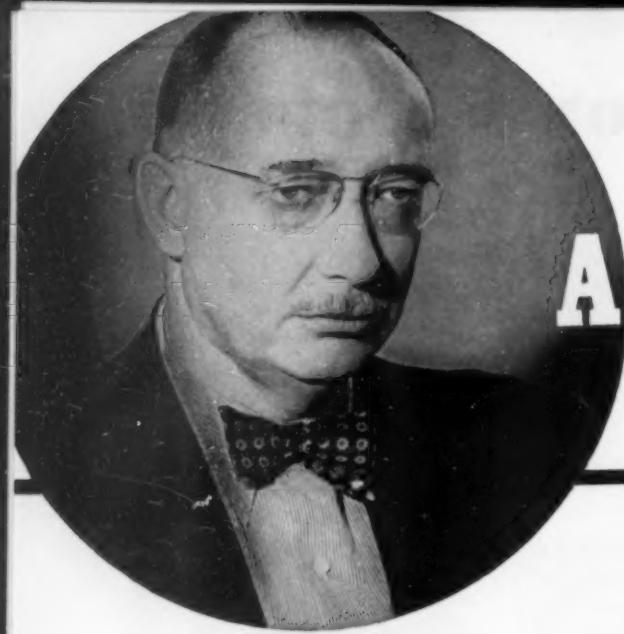
THOMPSON Products has announced a new turbocharger for high speed diesel engines in the horsepower range of 50 to 300. This turbocharger is especially designed for diesels used in automotive applications such as trucks, buses, and vehicular type construction equipment. It features rapid response and high operating efficiencies over a wide range of engine speed and load conditions.

The compressor-turbine assembly is designed to permit low rotating speeds, thus contributing to quick response of the turbocharger to changes in engine load conditions. This is particularly important in automotive type applications, where good acceleration qualities are essential. The turbocharger also has been designed for ease of maintenance, having no split bearings and simple, compact housings. Design of the turbine section of the turbocharger is such as to keep high exhaust-gas temperatures away from bearings and the compressor section. Connections for exhaust and intake air are fully flexible for ease of turbocharger installation on a wide variety of diesel engines.

The entry of this major supplier to the automotive industry into the turbocharging field further points up the widespread interest and importance today of turbocharging in the high speed diesel field. The successful application of turbocharging and its accompanying advantages of better fuel economy, higher horsepower output, and better overall engine performance, has helped increase the application of high speed diesels in new markets and is helping in no small measure to expand existing markets.

For more information on this interesting new turbocharger development, write Turbocharger Department, Department TC, Jet Division, Thompson Products, Inc., Cleveland 17, Ohio.





# AUTOMOTIVE DIESEL PROGRESS

A COMMENTARY BY MERRILL C. HORINE

Merrill C. Horine, for 38 years a member of the Society of Automotive Engineers, has been actively engaged in automotive engineering, sales promotion and training, advertising and editing of automotive publications since 1907. He has contributed numerous papers on diesel and allied subjects to the SAE and other organizations. An officer in the Air Service in World War I, he was a consultant to the Chief of Ordnance and the Automotive Division of the War Production Board in World War II.

## Do New Cycles Threaten Diesel's Future? Part I of Two Part Article

**R**EGARDLESS of ultimate eventualities, the diesel will for many years to come survive the impact of newer cycles. Of these, two hold the center of the stage at present. The imaginations of many engineers are engrossed with the free-piston engine, with its unequalled thermal efficiency and its opposite in this respect, the gas turbine. In approaching this subject from the standpoint of automotive application, we have a perspective quite different from that of the diesel field in general. It is quite possible that in the marine, stationary and railroad fields either or both of these will offer many attractions. Already the gas turbine has made such progress in the field of aviation that the piston-type diesel seems doomed before ever having a fair start.

Thermal efficiency unheard of heretofore appears to have been achieved with the free-piston gas generator; but it must be remembered that to complete the engine it is necessary to couple it to an engine. Currently this is of the gas turbine class. Despite the high efficiency of the generator, the overall efficiency of the complete powerplant is little if any better than a modern automotive diesel, for the gas turbine is inherently limited in this respect. So far, the gas turbine has proven anything but efficient, although great strides forward are being made. Both the free-piston and the gas turbine powerplants boast basic simplicity and absence of vibration and both exhibit a commendable ability to operate on a broad variety of fuels, including those of extremely low price. However, when developed to a point of practical application, both types require auxiliary devices for regulation and control and, in vehicular adaptations, for transmission of power that are both intricate and expensive. They are certainly light in weight until the latter elements are added and reasonably compact.

In assaying their possibilities as vehicle powerplants, we must consider the basic objectives sought in the selection of a power source. It is difficult to rank these objectives in their order of importance because of the influence of varying operating conditions and requirements upon them, but in general they are:

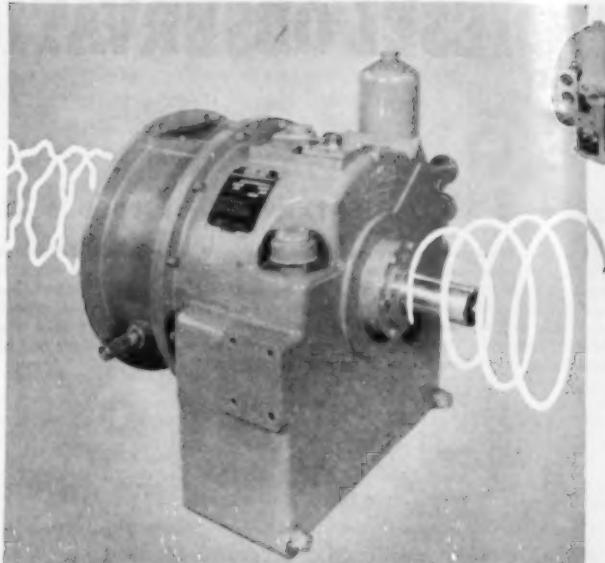
*Fuel Economy.* This is apt to be the primary objective in most applications. It is this fact that is principally responsible for the rapidly expanding popularity of the diesel at present. Naturally this factor encompasses both the price of the fuel per gallon and the rate of consumption per brake horsepower-hour. From the original concept of the diesel as an omnivorous consumer of most any sort of fuel, experience has narrowed the choice to a highly restricted range of specifications. Much the same tightening up of requirements is undoubtedly in store for the free-piston and straight gas turbine powerplants. For the free-piston engine the claim is made that it should win the fuel economy prize hands down, for as a generator it offers the highest thermal efficiency of any heat engine known. As previously mentioned, however, much of this advantage is lost by reason of the subsequent losses in the turbine. In applications involving a steady load, the economy of the cycle seems already demonstrated; but it is doubtful if this advantage will persist under the frequent and rapid fluctuations of load characteristic of automotive application. Both the free-piston engine and the gas turbine depend upon the turbine for the ultimate conversion of gas pressure and flow to mechanical torque and motion. In this respect, at our present state of knowledge, they have both advantages and limitations. Essentially a turbine's efficiency is variable according to its speed and load to a much greater degree than the piston type prime mover.

*Compactness.* This is an essential of growing import, both from the standpoint of revenue-earning capacity and convenience of operation and maintenance. The primary reason for the compactness of these alternative power sources is the high speed at which they operate. Surely a part, at least, of this advantage is offset by the extremely large gear reductions essential to bring the shaft speeds down to those required by the drive wheels of a vehicle. Moreover, by the time the formidable collection of auxiliary devices essential to make them operate effectively are added, the space requirements are not greatly different from those of a normal diesel installation.

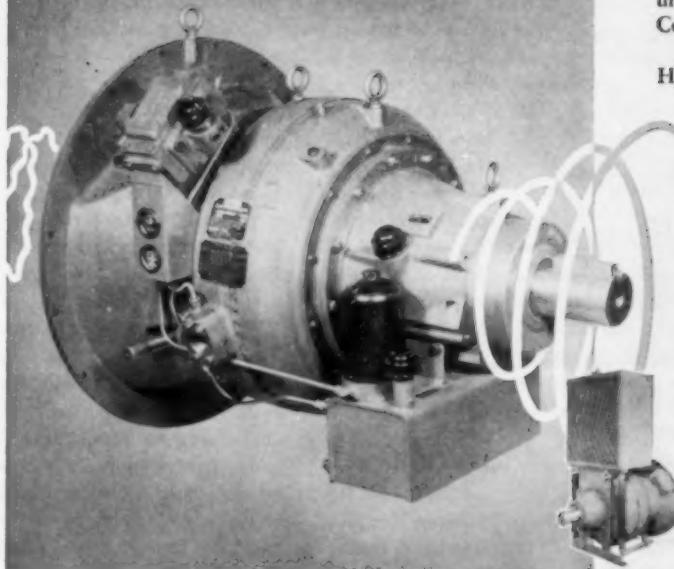
*Light Weight.* For the sake of revenue-earning capacity and its effect upon the weight and cost of the vehicle in general, the minimum weight consistent with other essential qualities is desirable. Here the diesel must unquestionably yield the palm to the other two; but the margin does not seem to be too great. As in the case of compactness, however, this lighter weight is achieved principally by the higher speed at which the others operate. A conventional truck, operating at 50 miles per hour, with 10.00-20 tires on the driving wheels turns its wheels at about 425 rpm. If the turbine runs at 26,000 rpm, it will require a total reduction of over 60 to 1 in high gear. If we grant that owing to the characteristics of the turbine our slowest ratio need be only half numerically of that required with a piston engine, this would then be about 300 to 1. Such gearing is bound to be bulky, heavy and costly.

*Flexibility.* Among the characteristics of performance, that of flexibility whereby the powerplant is able to accommodate itself almost instantly to swiftly and frequently changing demands upon it without suffering ill effects is extremely essential in an automotive vehicle. This embraces good accelerative ability, a reasonably broad range of effective operating speeds and the minimum dependence upon the driving train—the transmission, be it mechanical, hydraulic or electric. Undeniably the gas turbine does offer automatic adaptation of torque/speed relationships to variations in load; but in both cases at a sacrifice of efficiency of far greater magnitude than in the case of variable gearing. Moreover, such automatic adaptation is limited to a practicable range far narrower than required for heavy vehicles. Experience has shown that the hydraulic torque converter plus an adequate range of mechanical gear reductions offers possibilities, already beginning to be realized, entirely adequate to requirements. Up to now, neither the free piston engine nor the gas turbine has been able to demonstrate satisfactory flexibility.

*Editor's Note: In the next installment, Part II, Mr. Horine will discuss Reliability, Ease of Control, Vibration, Smoke and Smell, and Maintenance as concern the three types of engines.*



**Single-Stage  
Torque Converters  
or  
Three-Stage  
Torque Converters?**



The answer to the question of "single-stage vs. three-stage" depends largely on the characteristics of the equipment you manufacture or use and the jobs it is required to do. Naturally, many factors must be known before any engineering department can be expected to make recommendations.

Generally speaking, however, when it is desired to have minimum pulldown from governed engine speed—with maximum power output over a wide range—and to produce high torque ratios for hoisting or heavily loaded vehicles, a three-stage torque converter, with torque multiplication up to six times, may be most desirable. On the other hand, where mild torque conversion is required, as in certain types of vehicles and in other industrial equipment—a single-stage converter may be the best choice.

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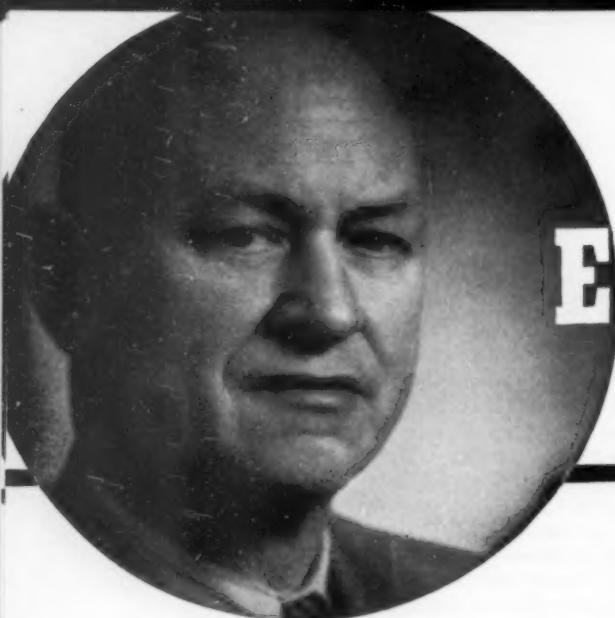
Twin Disc Clutch Company, Racine, Wisconsin; Hydraulic Division, Rockford, Illinois.

**TWIN DISC MAKES THEM ALL**



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# EASTERN DIESEL OBSERVATIONS

A COMMENTARY BY ARNOLD B. NEWELL

Arnold B. Newell, a third generation American, was born near Seattle, Washington of pioneer stock. He obtained his engineer's license at 21. Sailed as chief engineer on one of the first ocean-going motorships built in the U.S.A. In 1924 he joined New York Shipbuilding Company in diesel advisory capacity, tested and took to sea New York-Werkspoor diesels, supervised operation of shipyard owned vessels, then in 1927 joined Ingersoll-Rand as diesel field engineer. Became associated with "Motorship" in 1929. Subsequently became managing editor of "Motorship" and "Diesel Power," then vice-president and general manager.

## Small Farms and Small Diesels

On a recent trip in farming sections west of the Mississippi I talked with farmers and implement dealers about use of diesels. The engines as such interest these people but they have problems difficult to solve in a way that will provide them with the diesels they need. Many of the farmers operate on tracts of less than 200 acres which are considered too small to justify the higher cost of dieselizeled equipment, compared with less expensive mechanization by gasoline motors. Some of them work their small tracts evenings and week ends and hold down jobs of 40 hours a week in town to make ends meet. The dealers state that they can sell only about one diesel in every five tractors sold to the small farmers. These agriculturists are under pressure to consolidate their farms and go to heavy equipment but they prefer to be independents. The dealers hope smaller less expensive diesel tractors will become available. Meanwhile they complain that to sell any diesels at all, they must do all of the educating of the farmers in diesel advantages. They believe the diesel and implement makers should help them to educate the small farm operators in diesel superiority. None the less, several of them told me that they will go out of the spare parts business as soon as they become all-diesel dealers.

These dealers are not selling as many small diesel pumping units for irrigation as they believe they should. They say one reason small farmers cannot or will not go to diesels for irrigation work, or any other form of pumping for that matter, is that they have taken too many bad losses during dry seasons to be able to afford the irrigation facilities. It is the age-old problem of having to spend money to make money and having none to spend. At the same time the dealers believe that crop failures will eventually force the farmers to put in irrigation by hook or by crook and the sale of pumping units will increase. This is a pretty flimsy structure upon which to build sales hopes. They know it and they wish there were some way it could be reinforced. Some of the farmers are prosperous enough to install irrigation systems and do not believe in it. The dealers say there is a limit to the time that can be spent selling an idea before selling equipment. Spade work is expensive. There is a big potential for small diesel tractors

and small engines and an equally big selling problem, the answer not being clear to this reporter.

Meanwhile these same farmers are responsible for the purchases of substantial amounts of construction equipment by contractors who specialize in custom work for farmers such as making watering ponds and excavating for underground silos. Such sales show up in the construction field. The fact that dieselizeled equipment is being used on the small farms at all is a good sign. Some of them have already decided to do their own earth moving work during the off season.

## Rural Industrialization and Diesels

The diesel industry should, to my way of thinking, keep close tabs on rural industrialization. A lot of it went on and is continuing around me in the Eastern part of the country. Firms that were in crowded quarters in places like Hoboken, N.J. have moved to places like Danbury, Conn. and now have elbow room. The tremendous expansion of IBM in the Hudson Valley can not be overlooked by any one in that area. These examples are typical. The use of dieselizeled construction equipment to build rural industrial plants and the towns that crop up around them are matters I have mentioned in DIESEL PROGRESS. The expansion and routing of freight lines using diesel tractors to serve such areas has also come in for mention. References made in a casual way to such matters hardly reveal the full significance of what such developments may mean to the diesel industry. In Dallas, Texas and throughout the Southwest I made observations too numerous to include in this comment and for that reason I shall mention only two of them as typical examples. A diesel distributor in Dallas told me that 90% of his sales went to freight lines and bus companies.

In the Dallas suburban area the Brook Hollow Industrial District grows at a fantastic rate. In 1955 the industrial floor space in Brook Hollow increased 1,272,860 sq ft. In 1956 it jumped another 2,310,000 sq ft. As this area grows dieselizeled highway freight and bus services will jump in volume on the freeway passing by and crossing the district. As industrial products, foods, hospital appliances, laboratory equipment, rubber goods, seeds, paints and assembled auto-

mobiles come off the production lines, more diesels are needed for transportation. While the district expands dieselizeled equipment is needed to pave the streets and put in the water, gas and sewer lines. When this work is completed there remains a potential demand for diesels to generate cheap power for the industries of the district through use of the abundant supply of low cost gas for fuel. Not all rural industrialization is carried out on such a grandiloquent scale as Brook Hollow, but every one that crops up on the flatlands back of Boston, on the hillsides of New York, the wide open spaces of Texas, the outskirts of Seattle or in the valleys of California will better the diesel business. An important phase of this growing demand for diesels can be credited to rural industrial sites which take advantage of transportation by water, especially in the Midcontinent.

## Ranch Irrigation

The advantages of irrigation are well known to the ranchers whose crops have been lost through drought. In some instances the diesel engine burning gas as fuel has proved to be a solution to the problem of power for pumping. For example on one 32,000 acre ranch two 800 hp engines pump enough water to irrigate 22,500 acres. The amount required is about 2.5 acre feet of water per year or 650,000 gallons per acre. These engines are new and they replace a former gas fired steam plant that had a pumping capacity of 50,000 gpm. Each diesel and centrifugal pump now delivers 57,000 gpm to the irrigation canals. Pumping costs have been reduced to a quarter of what they were and the rate of pumping has more than doubled. The new pumping plant has permitted irrigation to be extended to pasture lands. Productivity of the ranch has been substantially increased.

This seems to be an ideal solution to a difficult problem of crop and cattle losses. There are many places where it can be applied in the future and many others where it can not. A supply of water is needed and no one rancher will be permitted to dry up a river to irrigate his land. Western rivers are often less than the name implies. However, where water permits can be obtained, the diesel solves the cost of pumping problem. It may also solve another problem of digging main canals, laterals, levees and ditches.

## New President for Erie Forge



A. R. Gaus

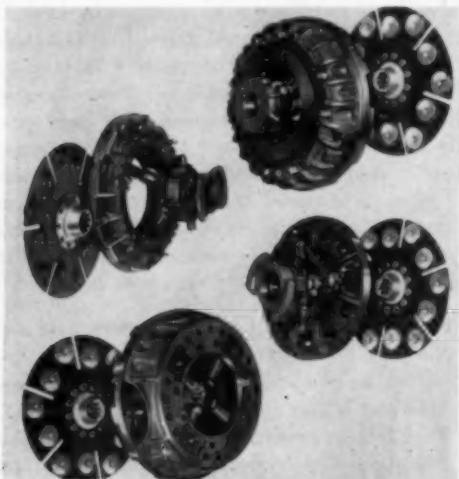
The Directors of Erie Forge & Steel Corporation announced the election of A. R. Gaus as President, effective July 1, succeeding E. H. Lang, who was elected Chairman of the Board of Directors. Mr. Lang, having served the Company for 55 years, expressed his desire to the

Directors that management of the Company be entrusted to the stewardship of a younger man and be relieved of direct supervision, thus affording him greater opportunity for study in other directions.

Mr. Gaus has been identified with the steel industry throughout his business career. Prior to becoming a Vice President of the Company in 1955, and a Director in 1956, he was Vice President of The Midvale Company, with whom he was associated for many years.

## New Clutch Development

The growing need for more and more power and longer and longer work hours has presented design engineers with the problem of devising clutches that help meet these requirements. A new clutch arrangement, using friction material with a



ceramic base, for use in heavy-duty and off-highway type machines is the result of Rockford Clutch Division of Borg-Warner Corporation research and development. Increased capacity, better heat disposal, better ventilation, cooler running, no fading, longer wear, fewer adjustments and more usable lining material are some of the improvements accomplished by this new type clutch. Rockford Clutch Division of Borg-Warner Corporation supplies this new Morlife clutch in both Over-center and Spring-loaded types in a wide range of sizes up to 18 in., single and double plate, designed and engineered for specific applications.

It is a generally accepted fact that an engineer can't talk without a pencil and a pad to make sketches on. S'a fact, you gotta illustrate the point for better understanding!

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**SF 212 DOUBLE WIRE BRAID HOSE** with SF 320 RE-USABLE SWIVEL FITTING for high pressure applications. Working pressure ranges: 1,125 to 5,000 psi.

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## WHAT'S GOING ON IN ENGLAND

CONDUCTED BY BERNARD W. LANSDOWNE

Bernard W. Lansdowne is an associate member of the Institution of Mechanical Engineers and is widely known among British and European diesel manufacturers as editor of our English contemporary "Gas & Oil Power." His early workshop training was spread over seven years with A.E.C., Ltd., Southall, following which he served some five years with that company's sales engineering department. He entered technical journalism as assistant editor of "Gas & Oil Power" in 1950 and was appointed editor in 1952.

### A New Ford Diesel

IT is just over five years since the Ford Motor Company at Dagenham, England, announced their first diesel engine design, a four-cylinder unit rated at 40 bhp for application in the Fordson Major tractor. A number of improved versions of this early unit have since been introduced and a further stage in the development of the Ford diesel range has now been reached with the introduction of a new six-cylinder power unit.

The new diesel engine operates on the four-stroke cycle with direct injection into a combustion chamber formed in the top of the piston. The cylinder dimensions are 100 mm. (3.937 in.) bore and 115 mm. (4.52 in.) stroke. The cubic capacity is 5,416 cc (330.5 cu in.) and the maximum rating is 100 bhp at 2,500 rpm. Maximum torque is obtainable at 1,500 rpm and is 242 lb ft which

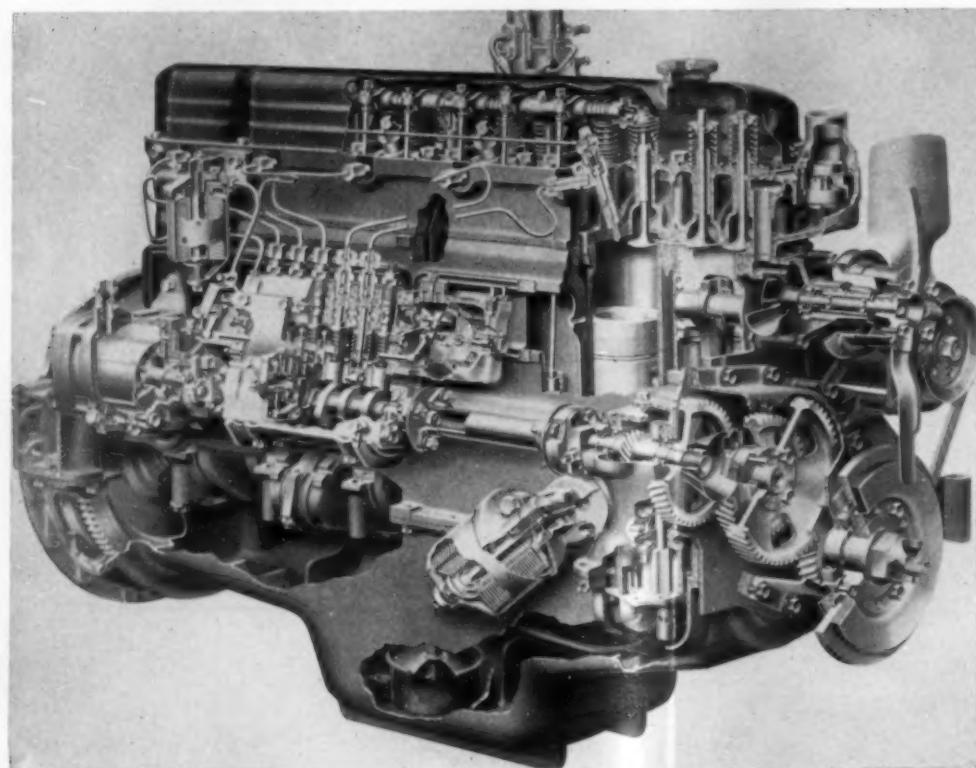
is equivalent to a bmeep of 111 lb per sq in. The mean piston speed is 1,885 ft per min. at maximum revs and the compression ratio is 16 to 1. A one-piece iron casting is used for the cylinder block and crankcase, the full length water jackets giving adequate circulation around each cylinder. The wet type liners are sealed by rubber rings at the bottom end. The cylinder head is also in one piece to cover all six cylinders and it carries the injectors and overhead valve mechanism, the latter being on conventional lines, push rod and rocker operated from the camshaft. The intake and exhaust valves are carried in separate guides pressed into the cylinder heads, and Eaton type rotators, together with renewable inserts are provided for the exhaust valves. The intake valve port diameter is 1.563 in. and the exhaust valve port diameter is 1.375 in.

The pistons are in die cast aluminum alloy and are tin plated, tapered and cam ground. In ad-

dition to the combustion chamber previously mentioned, there are valve recesses machined in the crown and each piston carries three compression and two oil control rings. A fully floating gudgeon pin secures them to the connecting rods. The crankshaft is a steel forging with induction hardened main and pin journals. It is carried in seven main bearings and fitted with four counterweights together with a torsional vibration damper at the front end. The centre main bearing takes the crankshaft end thrust, the bearings being steel backed, copper lead lined or alternatively lead bronze lined, if required. Effective bearing areas are 3.002 in. by 0.905 in. except for numbers 4 and 7 which are 3.002 in. by 1.280 in. The I-section forged steel connecting rods have a mean length between centres of 8 in. The big end bearings are replaceable steel backed copper lead or lead bronze, if required, with an effective bearing area of 2.5 in. by 1.342 in. For the small end a steel backed lead bronze bearing is used 1.25 in. in diameter by 1.75 in. long. The cam-shaft is carried in white metal steel backed bearings and has chilled cast cams. End thrust is countered by a sintered plate at the front end.

Simms Motor Units Ltd., of Finchley have supplied the fuel injection equipment for the new engine, the pump incorporating a pneumatic governor and vernier coupling together with an A.C. Delco fuel lift pump; the injectors are of the four-hole type. The lubrication system supplies full pressure oil to the main, connecting rod and cam-shaft bearings and a metered quantity of lubrication to the overhead valve gear. An external full flow of filter with replaceable element together with a screen filter in the oil sump and a piston type oil pressure relief valve are incorporated in the system which has an oil capacity of 2½ gal. The engine cooling fan is belt driven and can have either two or four blades of 18 in. diameter while the water pump also is belt driven and is of the centrifugal vane type with a double row ball bearing spindle. A bellows type thermostat is located in the cylinder head. Among the engine auxiliaries are a sliding vane type exhauster, a 12-volt Lucas electrical generator and a 12-volt Lucas starting motor. The engine air intake manifold is of aluminum alloy and it incorporates a venturi and butterfly control valve for the pneumatic governor. The dry weight of the engine without the clutch is 880 lbs.

Cutaway section showing main design features of the Ford 6 cylinder diesel.





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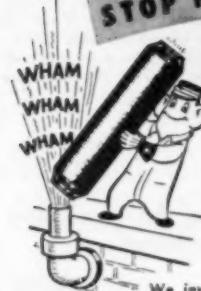
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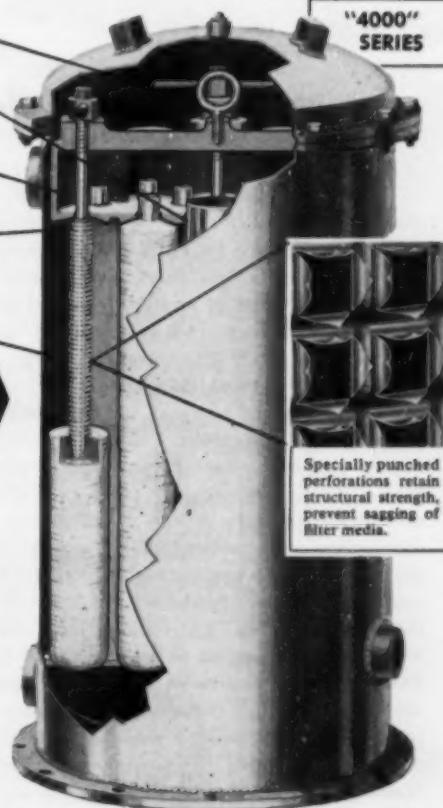
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# GAS TURBINE PROGRESS

— A COMMENTARY BY R. TOM SAWYER —

R. Tom Sawyer's well known in the gas turbine field having been the first chairman (1944) (and now treasurer) of the Gas Turbine Power Division of ASME. He spent 7 years with G.E. Transportation Dept., and 26 years with American Locomotive, now Alco Products. At present he is a Consultant, including "Consultant to the Staff" of the Experimental Towing Tank at Stevens Institute of Technology. In addition to being a Fellow Member of ASME and AIEE, he is a member of SAE, ARS, ANS, IME in London, DEUA in London. He is also a member of Franklin Institute and a Professional Engineer. Mr. Sawyer is the author of *The Modern Gas Turbine* and *Gas Turbine Construction*, and co-author of *Applied Atomic Power*.

## At C.I.M.A.C.\* in Zurich

Many papers at this conference describe diesel engines, all of which have gas turbine turbochargers, the remaining papers apply strictly to gas turbines. The following are abstracts from a few of the papers presented.

*Buchi Telescope Valve 4 Cycle Engine*—(Engine Specifically Designed for High Pressure Charging. Watch the Gas Turbine Combinations with this Engine.) Dr. Alfred J. Buchi\*\* has developed a remarkable new engine which has already undergone many years of experimental testing. This engine is an improved four-stroke cycle internal combustion engine which is specially built for pressure charging, preferably combined with scavenging, to sweep out the exhaust gases from and cooling the combustion space and a swirl generation in this space for a simple and perfect fuel distribution and combustion. The engine offers the advantage of a simple design, especially of the combustion cylinder head, the cylinder liner and the working pistons. The cylinder head castings also become simpler, as well as its manufacture. From the point of view of the working process, the surfaces of the compression and the combustion space become smaller than in conventional engines and improve the starting conditions on account of smaller heat losses; this has also an advantageous effect on the whole heat cycle and on the heat balance and the economy of the engine.

The cylinders of all engines of any size can be scavenged to any desired degree demanded by their special purpose and working condition. No awkwardly acting provisions like larger clearances, no cuts or specially shaped cams, etc., have to be applied. An effective swirl action in the cylinder space can be created and kept up during the whole scavenging and intake period. Therefore the fuel injection, distribution, atomizing and combustion will be greatly improved. Relatively low fuel in-

jection pressure is needed and, for the introduction of the fuel, only very large, preferably single-hole nozzles, not liable to any choking through fuel deposits, are quite sufficient. All this improves the fuel consumption and insures great safety and high reliability of the fuel injection equipment. It may also be said that the Buchi telescope valve type internal combustion engine is characterized by its wholly symmetrical design with respect to the cylinder axis, and this ensures also symmetrical and uniform thermal and pressure stressing of all parts surrounding the cylinder with its head, piston and valve system. The Buchi telescope valve type internal combustion engine might therefore be called a thermo-symmetric internal combustion engine.

Test results of a conventional engine with atmospheric induction and with charging with a Buchi turbocharger may be compared to the test results which were obtained when the respective engine was modified and re-built as a Buchi telescope valve engine. The bmepr under the prevailing scavenging and swirl conditions, could be increased with the Buchi turbocharged telescope valve engine in comparison to the conventional engine at its maximum from 100 to 170 psi. At the maximum speed of 1,800 rpm, the bhp could be increased from 98 to 190 bhp at the smoke limit. It is therefore seen that the bmepr could be increased by 70% at the speed range between 1,100 to 1,300 rpm. At the highest speed of 1,800 rpm the increase in bmepr compared with the conventional engine was 94%. It is also well worth noting that, in comparing the Buchi telescope valve engine with the turbocharged conventional engine, without any scavenging but only with a swirl action with masked inlet valves, the output could be raised from 136 to 190 bhp at 1,800 rpm engine speed. This means an increase in output of 40% in the turbocharged telescope valve type engine with its practically unrestricted scavenging and swirl action. This shows clearly the advantage which can be gained with the new valve system.

\*"Congres International Des Machines A Combustion" met the week of June 17, 1957. A bound volume of the complete papers can be purchased by writing direct to Mr. W. von Orelli, Secretariate CIMAC 1957, Case postale 362, Zurich 27, Switzerland.

\*\*2, Archstrasse, Winterthur, Switzerland.

*Development of The Long-Life Marine Gas Turbine*—Dr. T. W. F. Brown's\*\*\* paper is a most excellent and voluminous one on this subject. In looking into the future he states: It is quite certain that when fast reactors of, say, the Uranium 233 with a Thorium blanket are available, much higher temperatures can be achieved and it may then be necessary to use the liquid-cooled gas turbine as a means of generating power from the reactor heat. His conclusions however contain the following: It is hoped then enough has been shown in the previous section and the rest of the paper to indicate the merits of the gas turbine propulsion scheme even when uncooled in comparison with the steam turbine. The steam turbine chosen for comparison operates at 950°F which is about 100°F higher than current practice for machinery of this power, although several Pamestrada designed steam turbines are operating at sea at this temperature. Even so, the uncooled gas turbine is lighter, occupies less space and has a lower fuel consumption. Although the figures given for cubic volume of engine room space to main deck do not prove the space to be smaller, it should be recognized that the light and air space above the main deck will be very much less with a gas turbine than a corresponding steam turbine unit, and in total, the engine room volume for the gas turbine plant will be less than that for the steam turbine plant. This, however, can only be determined for specific projects when the ship arrangement has been developed beyond the main deck.

The operation of the *John Sergeant* in European waters and the early experience with the *Auris* gas turbine should lead to the necessary confidence in Ship-owning circles that the gas turbine has got the necessary reliability for service at sea. As the steam turbine operating at conditions up to 850°F can already compete with the heavy oil

\*\*\*Director, Pamestrada Research Station, Wallsend, Northumberland, England.

engine, the gas turbine should be even more economical as a propulsion unit. In comparing fuel consumption figures for the heavy oil engine it should be remembered that lubricating oil represents a costly item which does not apply in the case of the gas turbine. It should also be clear that if the heavy oil engine operates on low grade residual fuels, the question of renewals of liners, piston rings and similar parts has to be considered as a factor in conjunction with the fuel costs. The crux of the matter with the gas turbine, apart from experience at sea, is its ability to burn residual oil of the same grade as that burned under the boilers of steam turbine engined ships. This still remains to be proved in service, but there is enough experience in research work carried out by many agencies to show that the problem is not regarded as insoluble, and in fact there are clear indications that residual fuel can be burned without corrosion or build up. In the previous section an attempt has also been made to look into the future and there will be found that the high-temperature liquid-cooled gas turbine is even more competitive in weight, space and fuel consumption, and it also should have priority as a marine propulsion unit when suitable high temperature reactors have been developed.

*Gas Turbines As Prime Movers In Power Stations And Steelworks*—Mr. H. Pfenninger \* wrote a very comprehensive paper as shown by quoting a portion of the Summary: The article describes experience obtained over long periods with the gas turbine as prime mover. A fairly large number of gas turbines have been operating in industrial service for many years in power stations and steelworks, either generating electric energy or furnishing compressed air for blast furnaces and Bessemer converters. Reliable data on operating costs, staff remuneration, availability and maintenance costs are now available and can be compared to that of other prime movers. Operating

experience over long periods are given of gas turbine power plants using heavy bunker C oil, blast furnace gas or natural gas as fuel. The units compared range between 1,600 kw and 27,000 kw. To the experience gained over periods of 34,000 hours of actual running time, the results of units having been subjected to a large number of quick starts are added. The methods of cleaning the gas-turbine blades without dismantling the turbine in about two hours are described. These methods of cleaning gas turbine blades from deposits have proved successful during years of operation. The time intervals between successive cleaning and maintenance operations are given. Maintenance costs are established individually for the combustion chamber, the gas turbine itself and other components. A trend of future developments is evident from the statement that a large number of units are being built for still higher temperatures with blast-furnace gas as fuel. For gaseous fuels the admissible temperature for gas turbines is only limited by the mechanical behavior of the material. When operating on heavy fuel oil the maximum temperature is fixed by the corrosive action of the fuel ash. Some of the latest results of corrosion tests with and without additives to the fuel oil are given, and finally recent efforts to prevent corrosion are discussed. Since it is only in the last two decades that the gas turbine has attained a stage of development of industrial importance, operating experience has not been long enough until now to enable the performance of this class of prime mover to be more or less reliably assessed.

There are many more excellent gas turbine papers from which abstracts could be taken to say nothing about the large number of diesel turbocharging papers. As space does not permit we recommend that the bound volume of proceedings be purchased direct from CIMAC.

\*Brown Boveri & Co., Ltd., Baden, Switzerland.

#### Assistant Chief Engineers



R. F. Kymer



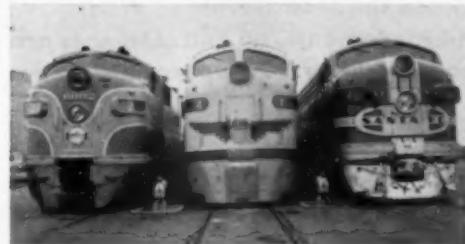
M. J. Helmich

The promotion of R. F. Kymer and M. J. Helmich to the position of Assistant Chief Engineer is announced by Ralph L. Boyer, Vice President and Director of Engineering of the Cooper-Bessemer Corporation, Mount Vernon, Ohio. As assistant Chief Engineer of Cooper-Bessemer's Company Products Division, Mr. Kymer will work under the direction of D. L. Gallogly, Chief Engineer of this division. Mr. Helmich, as Assistant Chief Engineer of the Development Division will work under the direction of W. R. Crooks, Chief Engineer of that particular division.

Rapid growth in both these two engineering divisions has been responsible for the initiation of

the two new posts, Mr. Boyer points out. The two new positions will help maintain closer personal relationships between the operators of engines and compressors and the company's engineering staff at Mount Vernon.

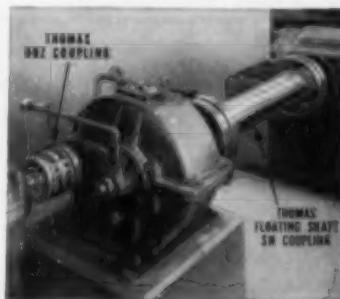
#### Unique Railroad Gathering



Just a little oftener than Haley's Comet flashes by you find diesel locomotives of three railroads coming at you on three parallel tracks. This happened recently in Los Angeles when the Southern Pacific, Union Pacific and Santa Fe railroads teamed up in an observance of "Invest in America Week". To make this fraternization of locomotives still further unusual, all three came out of the same shop, the La Grange, Illinois plant of Electro-Motive Division of General Motors.

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NO WEARING PARTS

Future maintenance costs and shutdowns are eliminated when you install Thomas Flexible Couplings. These all-metal couplings are open for inspection while running.

They will protect your equipment and extend the life of your machines.

Properly installed and operated within rated conditions, Thomas Flexible Couplings should last a lifetime.

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Write for Engineering Catalog 51-A

## THOMAS FLEXIBLE COUPLING CO.

WARREN, PENNSYLVANIA, U. S. A.

## Florida Diesel News

By Ed Dennis

A PAIR of Caterpillar model D318 diesels were installed in Gordon Varney's new 70 ft yacht. These diesels develop 90 hp; installation also included 2:1 Capitol r&r gears and a Caterpillar D311, 20 kw generating set.

THE *Broadbill*, a 50 ft drift fishing vessel out of Deerfield Beach, was repowered with two 6 cyl. General Motors diesels of the 71 series and 1.5:1 Twin Disc r&r gears. The *Grayline #2* sightseeing vessel was also repowered with GM 6-71 diesels and Twin Disc 2:1 r&r gears. Both installations were made by Ellis Diesel Sales & Service of Fort Lauderdale.

ALL THREE of the shrimp trawlers recently launched by Diesel Engine Sales, St. Augustine, were powered with D342 Caterpillar diesels furnished by the Gibbs Corp. They have Twin Disc power take-off and 3:1 Snow Nabstedt r&r gears. The *Captain Spear*, which fishes Campeche and is owned by Charles Ludwig of Miami, has a Petter diesel engine for auxiliary purposes.

HUGO Buechelmaier, general sales manager of Daimler-Benz of North America Inc. announced that Arthur R. Hamm will be the Florida distributor for the Mercedes-Benz diesel engines; the sales and service facilities are in Miami.

DADE Drydock launched for the West India Shipping Co. the *Inagua Wave*, a 150 ft combination freighter and liquid carrier powered with two D375 Caterpillar diesels and 3:1 Snow Nabstedt r&r gears. The two 19 kva Cat diesel generating units have Schwitzer air cranking motors. Ross heat exchangers are used on the main propulsion diesels.

PURCHASE of the Diesel Shipbuilding Company of Jacksonville by J. H. Coppedge & Associates, represents the return to the shipyard by its founder. The firm was organized by Mr. Coppedge and George W. Codrington in 1949; shortly thereafter it was sold to other interests. The yard was most recently owned by Diesel Engine Sales Inc. of St. Augustine. Winston Owen is Vice President and General Manager. Their specialty is diesel tow boats.

TWO MODEL LRD Waukesha diesels are providing power in the newly launched 110 ft menhaden fishing vessel *Sigmund Schoenberger* built for the Quinn Menhaden Fisheries. The Waukesha diesels develop 350 hp each driving 60x44 Columbian propellers through 3:1 Capitol r&r gears to give the vessel a top speed of 16 knots. A Petter diesel drives the air compressor.

IN THE Redlands, the City of Homestead, will be adding two 10 cyl. Fairbanks, Morse diesel generating sets. These model 31A18 basic oil diesels are rated 3500 hp each.

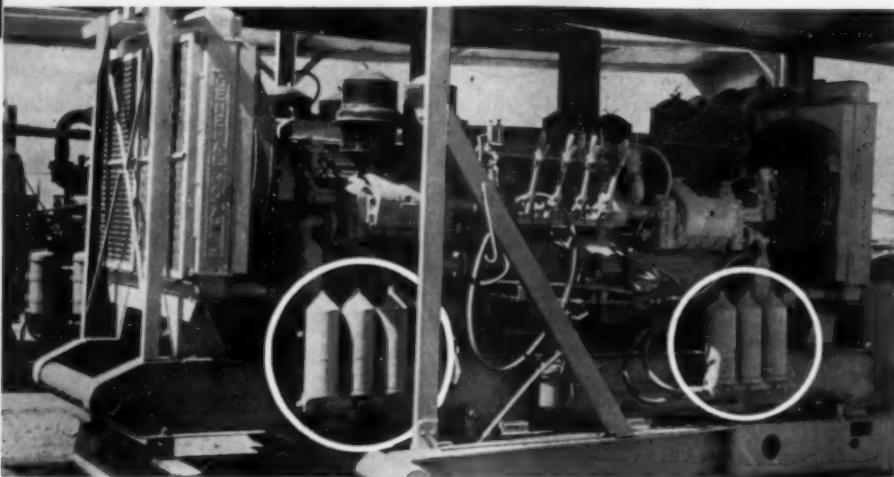
A Cummins model NT6BI diesel was selected for prime power in a Hough #PH65 Payloader tractor shovel for C. Meckins Inc. of Hollywood and General Portland Cement Co. received a Marion 101-M dragline with a Cummins NHRIS 300 hp diesel.

TWO Mercedes-Benz diesels in the 600 hp class were selected by Arthur V. Davis for repowering his 70 ft yacht, *Scarlet O'Hara*. A feature article will contain more information on this gasoline to diesel installation in a future issue of DIESEL PROGRESS.

THE 40 foot *Seaguest* was recently launched at Chris Boat Yard and is powered with two 4-71 inclined General Motors diesels and 1.5:1 GM torque marine gears manufactured by the Allison Div. Capt. Red Stuart is the skipper and it will be used for marine research work.

## WINSLOW Full-Flow FILTERS

Case History Report No. 37 Shows Why Engines  
Protected by WINSLOW FILTERS Last Longer



### LUBE OIL KEPT CLEAN A MONTH INSTEAD OF A WEEK with Winslow CP\* Filters

Porter-Loughlin Company of Odessa, Texas, one of the largest Texas oil drilling companies, operates many drill rigs. Power for some electric generators is supplied by a quad installation of four 6-71 GM engines. The engines run 24 hours a day—a real tough test on lube oil—on filters and on engines.

**With original filter equipment, oil and element changes were made every week. Since the installation of WINSLOW B-74 Full-Flow Filters, with CP\* elements, oil and elements are changed only once a month or after 720 operating hours.**

That's important in operating costs, and other big savings are longer engine life and lower maintenance cost, with the use of Winslow Filters. Ask about the application of modern CP\* filters for all your powered equipment.

#### CP\* FILTRATION

Winslow patented CP\* (Controlled Pressure) elements are designed to continuously self-adjust the pressure within the filter and allow for a full stream of filtered oil without opening by-pass valves. This is accomplished through the dual flow capacity, with two types of material in the same element.

\*CP is fully protected by patents and trademarks

ENGINEERING & MANUFACTURING COMPANY

4069 Hollis Street, Oakland, California

W-2593-A

**WINSLOW**

RECENTLY installed and already operating are three model 40 Superior diesel generating units with 250 kw Ideal generators for the Pinellas Air Force Base.

KEY WEST will be the hailing port for all three shrimpers, *Tourus*, *Gemini* and *Lois Joyce* launched at the Morehead City Shipbuilding Corp. Main propulsion is D342 Caterpillar diesel driving 48x38 four blade Southern propellers through 3:1 r/r gears.

RECENT marine installations made by the Jacksonville Branch of Cummins Diesel Engines of Florida included a model HRM 600 in the shrimp trawler *Theofilos* owned by S. J. Lewis of St. Augustine and at Fernandina Beach. Sherman Evans' twin screw 57 ft trawler received engines of a like model. These 6 cyl. 4 1/8 x 5 in. Cummins diesels are rated 165 hp at 2500 rpm.

WE VISITED the Lake Worth Power Plant recently and took a look at the two Nordberg diesel generating units. These have a 21 1/2 bore x 31 stroke and are rated 3540 bhp at 225 rpm. The peak load is 8100 kw and they expect to go over 39,000,000 kw in 1957. M. E. Hyde is chief engineer of this efficiently run plant.

FOURTEEN General Motors model 6028-C (6-71) diesels are installed in the seven auxiliary pump houses at Miami's Alexander Orr water production plant. Installation also includes GM and Rockford power take-offs to drive the Amerillo right angle pump drive for the A. D. Cook pumps. Each twin develops 280 hp at 1460 rpm. For the second year in a row the Alexander Orr plant has won First Prize for lime softening water plants from the State Bureau of Sanitary Engineering.

THE Osco Motors Corp., who handle the Ford marine diesel engine, announced that their 4DF series are being sold and serviced by Diesel Power Corp. Miami and at Tampa the Guaranteed Marine Engines takes care of Gulf marine wants.

THE NEW 55 ft Hatteras trawler *Miss Pearl* is equipped with a 6071-A General Motors diesel and keel cooling. The engine drives a 40x32 four blade Southern propeller through GM 3.75:1 r/r gears. Morehead Shipbuilding Corp. also launched the *Capt. Puck* with a similar installation.

THE announcement by American MARC of new technological developments, one of which was plans for the production of diesel outboard engines for small craft, stirred fresh speculations that this firm may still locate an east

coast assembly branch in Dade County, Florida. It is estimated that the American MARC diesel outboard engines will be produced commercially within twelve months.

#### Tulsa District Manager

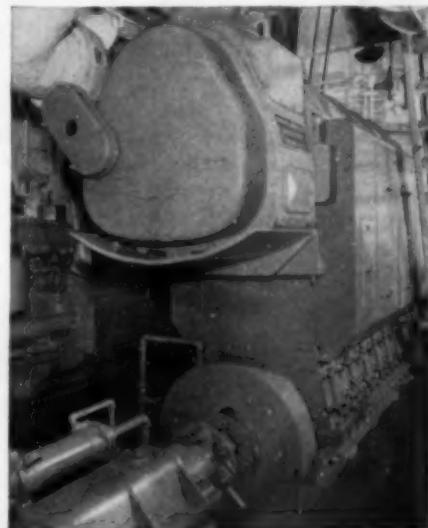
The appointment of Arthur Abel, Jr. as District Manager of Cooper-Besse-

mer's Tulsa office is announced by Stanley E. Johnson, Cooper-Bessemer Vice President and Director of Sales. Formerly Branch Manager of the Company's Odessa, Texas office, Mr. Abel will now head all field sales and engineering activities in the Tulsa area. Mr. Abel fills the position formerly held by B. L. Potter, who has retired from active service with this engine and compressor building firm.

A graduate of Oklahoma A. & M. in Mechanical Engineering, Mr. Abel went to Cooper-Bessemer in 1940 and received his compressor engineering at the main plant in Mount Vernon, Ohio. In 1944, he was assigned to the Los Angeles office as Sales Engineer before transfer to the Odessa, Texas office.

## NEW TUNA CLIPPER UNITED STATES

From bow to rudder, the new tuna clipper *United States* is the latest in design perfection. Built by the National Steel and Shipbuilding Corporation, she features an efficient hull design that is the result of extensive model test studies. Rudder design evolved from a recent high-speed N.A.C.A. airfoil shape. The result: the most modern tuna clipper afloat, with a fish-hold capacity of 340 tons plus ample sea stores to reach distant fishing grounds and return.



## O-P POWER

Main engine in the *United States*, like the entire fleet of these modern clippers built by NASSCO, is a heavy-duty 960 hp. Fairbanks-Morse Opposed-Piston Marine Diesel. Selected for modern efficiency, reliability and economy, the O-P offers:

**Two-Cycle Design**—that eliminates more than 40% of the moving, wearing parts found in comparable engines.

**Opposed-Pistons**—of equal weight in a single cylinder—and contrarotating cranks produce smooth, vibrationless power.

**Uniflow Scavenging**—eliminates crosscurrents and provides greater horsepower, thermal efficiency and the utmost in fuel economy.



## F-M PUMPS

More than 20 Fairbanks-Morse pumps, powered by F-M motors, move large volumes of liquids above and below decks: brine and bait water . . . fresh and sanitary water . . . ballast and bilge . . . fuel and lube oil. Pump specifications call for as many as 13 vertical centrifugals to rotaries, piston and Builtogthers for each of the specialized marine applications.

Fairbanks, Morse & Co., Dept. D P - 8, 600 So. Michigan Ave., Chicago 5, Ill.



**FAIRBANKS-MORSE**

*a name worth remembering when you want the BEST*

DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • RAIL CARS • ELECTRICAL MACHINERY • PUMPS • SCALES • HOME WATER SERVICE EQUIPMENT • MOWERS • MAGNETOS

## Twin Disc Advertising Manager



E. B. Falk

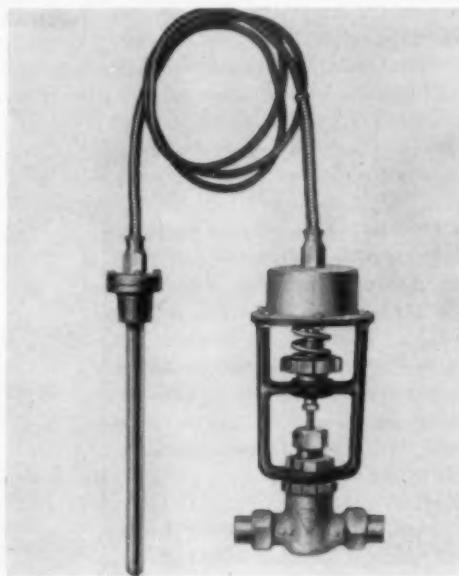
Appointment of E. B. Falk as Manager Advertising and Sales Promotion has been announced by Twin Disc Clutch Company, Racine, Wisconsin. Mr. Falk joined Twin Disc in 1946 as a Sales Correspondent and progressively advanced to Sales Engineer, Application Engineer, Installation Engineer and Administrative Assistant, General Sales Department. He was graduated from the College of Engineering, Marquette University, in March, 1942, with a Bachelor of Science degree.

in Mechanical Engineering. While serving in the U.S. Navy during World War II, he attended Massachusetts Institute of Technology, and received a certificate in Aeronautical Engineering. Mr. Falk is a member of the Society of Automotive Engineers and is a commander in the U.S. Naval Reserve.

## Temperature Regulator

Watts Regulator Company, Lawrence, Massachusetts, announces a new line of single seated temperature Regulators for automatic flow regulation of liquids or steam. These self-operating regulators are of two types, direct acting and reverse acting. Direct Acting Regulators (155 Series) maintain the liquid temperature by controlling

the heating source. They are available in sizes  $\frac{1}{2}$  in. to  $1\frac{1}{2}$  in. inclusive. Reverse Acting Regulators (157 Series) maintain the liquid temperature by controlling the cooling source. They are available in sizes  $\frac{1}{2}$  in. to 1 in. inclusive.



Both types are easily adjusted for temperature control within a 40°F operating range within 100°F and 240°F. They feature overheating protection and rugged bronze body construction with replaceable stainless steel seats. Complete information about Watts' new Temperature Regulators is available in their Bulletin S-155. ITS NEW

## Diesel Workhorse

This International UD-14A power unit is one of a pair Liverman Lumber Co., New Bern, N. C., uses to produce 1,000 bd ft of pine and cypress lumber per hr on sawmill and planer mill operation near



that city. The unit shown here powers a Yates-American 10 in. planer and a 35 in. blower-type fan. The other pulls a Meadows #1 mill with 48 in. circular saw, two-saw edger and 50 ft of dust chain. Liverman manufactures rough and dressed lumber to be used in general construction.

Despite all the automatic protective devices on the modern engine, a crank knock is a crank knock, a piston slap is a piston slap, blow-by is blow-by, smoke at the exhaust is smoke at the exhaust, a cold engine is a wasteful engine and by the Eternal you'd better keep on using eyes, ears, nose and horse sense.

## The World's Leading Manufacturers of FUEL INJECTION EQUIPMENT for Diesel Engines



## FUEL INJECTION EQUIPMENT DIVISION of LUCAS ELECTRICAL SERVICES, INC.

Head Office: 653 Tenth Avenue, New York 36, New York

Sales Office: 14820 Detroit Avenue, Cleveland 7, Ohio

West Coast: 5025-29 W. Jefferson Blvd., Los Angeles 16, California

### Canadian Distributors:

Joseph Lucas (Canada) Ltd., Head Office: 11 Davies Avenue, Toronto 8, Ontario  
Branch Office: 3401 St. Antoine Street, Montreal 30, Que.

AP.174-820

# VERSATILE OFFSHORE SERVICE VESSEL

BY DOUGLAS SHEARING



M.E.L. I is 142 ft by 34 ft 1 in. by 10 ft 6 in. and is known as a rig tender, powered with 1200 hp total, of Detroit Diesels supplied by Stewart & Stevenson Services.

**A**VESSEL that carries both liquid and solid cargo like a barge, tows like a tug and accommodates crewmen and passengers like a pleasure boat has been put into the service of the oil industry's fleet by Tilman J. Falgout. Named the *M.E.L. I*, the vessel claims title to the world's largest in its class. It is a whopping 142 ft in length, has a beam of 34.1 ft and a draft of 10½ ft, and the proper description of the *M.E.L.* is rig tender.

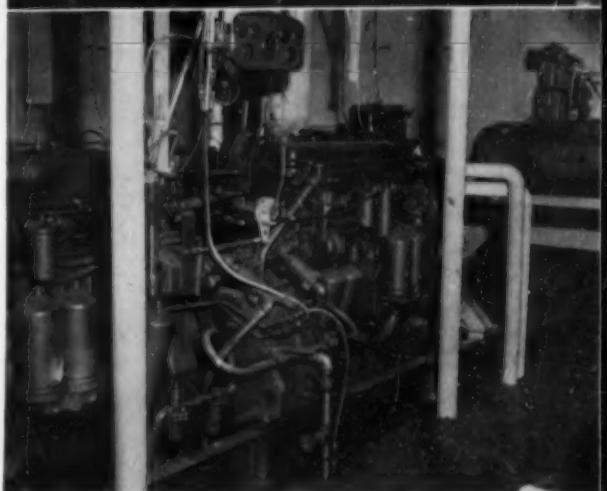
In spite of its gross tonnage of 194.5 (131 tons net), the vessel can travel 14 miles an hour loaded. It can haul a huge payload quickly in any water and thus is available for foreign work. The power that enables it to do the above is in the form of two Stewart & Stevenson Services, Inc. GM Detroit diesel tandems. That means the *M.E.L.* has a total of four series 6-110 diesels for primary power turning two 60 x 40 in. propellers at 400 rpm normal. In addition, there are two 40 kw generators, each powered by a 4-71 GM diesel engine. Total horsepower is 1,200.

The vessel, constructed by the Burton Construction and Shipbuilding Company of Port Arthur, is a big sister to the *George Falgout* which was registered in August of 1955. The *Falgout* also built by Burton, is 130 ft in length with a beam of 30.1 ft and draft of 8½ ft. Its gross tonnage is 82 tons. It is also powered by GM Detroit diesel tandems. The *M.E.L.* can carry a crew of five, but can sleep 14. Galley facilities include an all-electric kitchen. The study that went into the design and construction of the vessel resulted in Coast Guard approval. The tender has three decks, but it

is not necessary to go topside to get to the engine room from any other compartment. Other features include power steering, the latest in radar equipment, ship to shore telephone, an inter-telephone system and an electric chain winch. The *M.E.L.* can carry 4000 barrels of fuel for rigs and 450 tons of various rig supplies. It can transport enough drill pipe to dig an 18,000 ft well.

Mr. Falgout has an interest in the Gulf of Mexico that dates back 35 years. He was in his very early teens when he got into the shrimp business with his father. That was in Golden Meadows, La. He never lost his taste for the little creatures, for today he has an interest in 25 shrimp boats that operate out of Galveston, Brownsville and Aransas Pass. But, offshore oil operations have received most of his attention since 1948, and that makes him a real veteran in that field. It is a matter of fact that Mr. Falgout pioneered the service business for the companies looking for oil and gas in the Gulf. His interest in the oil business is evidenced from the fact that he operates four barge type vessels and 15 cargo and supply craft. These 19 vessels are 100 per cent GM Detroit Diesel powered, having a total of 66 engines. Mr. Falgout has been operating out of Galveston for the past 15 years. T. J. Falgout is general manager of the operations and Frank Graham is port captain.

At top right Tilman J. Falgout at the wheel of this hard-working, sea-going service vessel. At right, engine room view of one of the Detroit Diesel 6-110 tandems. Note Quincy compressor also.



## Mid-Continent

### Diesel News

By Jack F. Cozier

PHILLIPS Petroleum Co., Bartlesville, Okla., recently leased a 150 kw Cat D-337 diesel electric set from Hoover Equipment Co., Oklahoma City, Okla.

for Phillip's uranium mine in Grants, New Mexico.

VILLAGE of Wells, Minn., has bought a Fairbanks, Morse 12 cylinder, 1920 hp, model 38D8-1/8 dual fuel generating set.

LOFFLAND Brothers, Tulsa, Okla., will be utilizing 14 crew boats built by Stewart Seacraft, Inc., Berwick, La., as crew

boats in Venezuela. Nine of the boats are 40 ft long powered with two Cummins NRT marine turbodiesel engines along with five 34 ft boats powered by Cummins JT-6 marine turbodiesel engines with the engines being furnished by Cummins Sales & Service, Inc., New Orleans, La. Other equipment utilized are Capitol hydraulic reduction gear, Columbian Tru-Pitch propellers, Sutton bilge pumps, Stewart-Warner instrument panels, Ross automatic steering controls, Morse S Marmac cable throttle controls, and Corsair compasses.

the company utilizes four White 9000-TD tractors with Cummins JT6B turbodiesel engines and a new 150 kw generator powered by a Cummins NRTO turbodiesel engine.

ELECTRIC Auto-Lite Company, Toledo, Ohio, has received two Fairbanks, Morse six cylinder, model 38F5 1/4, 450 hp diesel engines.



### 1,000 hp units operate at full load in world's hottest location

Not even the fierce heat of Kuwait or general water shortage in the area can impair the efficiency of the Young equipment used to cool the jacket water, supercharger intercooler water and engine oil on the engines of the four 1,000 hp pumping units designed and built by the Enterprise Division of General Metals Corporation of San Francisco.

Young equipment identified above: (1) Radiator Model MWC-455 with separate cooling sections for jacket water-supercharger intercooler water and engine oil. (2) Young Mono Weld construction turbo-charged air intercooler. (3) Model OCS-300 Torque Converter Cooler.

"WHERE QUALITY COUNTS"

Let Young Radiator solve your heat transfer problem. Write today to Dept. 407-H for catalog 1356. There is no obligation.



SHEEHAN Pipeline Construction Co., Tulsa, Okla., has purchased an Insley K-12 back hoe powered by a Cat D311 diesel engine for pipe line work in Ohio. The sale was made by Tulsa Equipment Co., Tulsa.

DOLESE Concrete Co., Oklahoma City, Okla., has repowered a model 41 Northwest shovel with one cu yd capacity with a GM 4045-C diesel engine from Diesel Power Co., Oklahoma City.

WILLIAMS Brothers Co., Tulsa, Okla., bought a Cleveland model 320 trencher from Leland Equipment Co., Tulsa. The unit is powered by a Cat D330 diesel engine and will be used for pipe line construction.

CONTINENTAL Emsco Co., Dallas, Tex., has purchased two Cat D-326 100 kw diesel electric sets with control panels for an offshore drilling barge. The sale was made by Hoover Equipment Co., Oklahoma City, Okla.

CITY of Tulsa, Okla., has bought a Cleveland 140 trencher from Leland Equipment Co., Tulsa, with an International UD-350 diesel engine utilized for power.

MIDWESTERN Constructors, Tulsa, Okla., is using on a pipeline in Illinois a Unit 1020A 1/4 yd back hoe purchased from Midwestern Engine & Equipment Co., Tulsa. The unit is powered by a GM 3-71 diesel engine.

JACK BRISCOE Construction Co., Stillwater, Okla., bought an Allis-Chalmers HD6G loader for general contracting work. The sale was made by the Boardman Co., Tulsa, Okla.

MULLNIX Construction Co., Oklahoma City, Okla., purchased a Cat D-318 G turbocharged 75 kw electric set from Hoover Equipment Co., Oklahoma City, to power a Cedar Rapids crusher.

STRAIN Brothers, Inc. San Angelo, Tex., are operating 10 Autocar model DC-103-D 12 cu yd dump trucks powered by Cummins HRFB-600 diesel engines for hauling rock to their rock crusher. Also

**Power on tap!**  
**A NEW 5 TO 50 KW**  
**"PACKAGED" GENERATOR**

### REG-AMP



REG-AMPS are available for 1800 and 1200 rpm operation, single- or 3-phase power, at all standard low voltages. REG-AMP shown has single bearing. Two bearing units are also offered.

### It's a complete source of a-c electric power and the perfect mate for your engine

REG-AMP is a revolving field a-c generator with direct-connected exciter, built-in automatic voltage regulator, and a-c ammeter and voltmeter. It's factory assembled, internally connected, and tested.

**Regulates voltage automatically.** Simple relay constantly senses output voltage and keeps it right for best operation of your motors, lights, and electronic equipment.

**Positive voltage control.** Voltage can be adjusted to compensate for line voltage drop or normal engine speed droop under heavy load.

**Starts big motors fast!** Coordinated regulator design gives quick response.

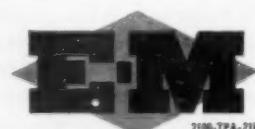
**Easy to install, simple to operate.** Fully self-contained. Requires no switchboard. Merely couple to engine and connect to load thru suitable switch.

**Needs little maintenance.** Only an occasional check for cleanliness and brush wear.

**Fabricated steel frame.** Rigid, drip-proof frame keeps REG-AMP safe, clean, and dry.

**Performs smoothly.** Every design is painstakingly engineered. REG-AMP is a product of 50 years of E-M Generator experience.

*Get more information from your nearby E-M Sales Engineer. Also, write E-M for publication PRD-246 . . . it gives complete REG-AMP ratings.*



**ELECTRIC MACHINERY MFG. COMPANY**  
Minneapolis 13, Minnesota

Largest manufacturer of "Packaged" Generators

DOLESE Brothers Co., Dover, Okla., has repowered a model 25  $\frac{3}{4}$  cu yd Northwest Shovel with a GM series 71, 75 hp, model 3030-C diesel engine from Diesel Power Co., Oklahoma City, Okla.

EARL Swatek Construction Co., Oklahoma City, Okla., repowered a Buckeye dumper with a Cat D-318 diesel unit from Hoover Equipment Co., Oklahoma City.

TROTH Construction Co., Oklahoma City, Okla., purchased a Cleveland model 140 trencher powered by an International UD-350 diesel engine. The sale was made by Leland Equipment Co., Tulsa, Okla.

REESE Brothers Company, Hugoton, Kan., bought a Cleveland 140 trencher powered by an International UD-350 diesel engine from Leland Equipment Co., Tulsa, Okla.

FAILING Supply Co., Enid, Okla., purchased a series 71 model 6031-C GM diesel engine from Diesel Power Co., Oklahoma City, Okla. The 195 hp unit will be used on a drilling rig to be exported.

BERRY Equipment Co., Muskogee, Okla., bought a Cleveland 140 trencher powered by an International UD-350 diesel engine from Leland Equipment Co., Tulsa, Okla.

M & M Construction Co., Headland, Okla., purchased an Insley model L crane from Tulsa Equipment Co., Tulsa, Okla. The unit is powered by a Cat D315 diesel engine and is being used as a dragline in construction work in building the dam for the Chikashia water supply.

#### Detroit Diesel Appointments

Appointments of Donald E. Schwendemann as manager, organization and business management and Chester B. Clum, Chicago regional manager for the Detroit Diesel Engine Division of General Motors were announced today by Robert E. Hunter, general sales manager of the division. Mr. Schwendemann, who has been Chicago regional manager, will now be responsible for business management programs for Detroit Diesel distributors and will establish and administer policies designed to assist the distributor organization.

#### Phase Voltage Converter

Weighing only 39 lbs, this compact, lightweight converter changes single phase, 115 volt, 60 cycle AC to three phase, 230 volt, 60 cycle current. Frequency is held constant within a fraction of a cycle. The durable aluminum alloy frame houses capacitor starter as well

as both output and input receptacles, and is about 10 inches high without carrying handle. Intake and exhaust air vents are located in lower halves of end-bells, making the converter drip proof. Heavy duty grease sealed ball bearings produce very little noise. Equipped with vibration dampeners, the machine can be used to change phase and voltage for sound track equipment if placed a

few feet away from recording equipment. Other models and sizes, now in the engineering stage, developed to meet growing demands for on-the-spot phase and voltage conversion, will soon be available. When ordering, specify input and output characteristics desired. These converters are developed and manufactured by Kato Engineering Company, Mankato, Minnesota.

ITS NEW

**NOW AVAILABLE!** The Brand New **DIESEL ENGINE CATALOG**, Volume 22. This giant, 400 page, 10 $\frac{1}{2}$ " x 13 $\frac{1}{2}$ ", fully illustrated reference book containing complete and detailed engine and accessory sections is the biggest and best yet. Mail orders are now being filled for this "Bible of the Industry," which has been revised, rewritten and brought up to date completely from cover to cover. Send your order in now for this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company orders to **DIESEL PROGRESS**, 816 N. La Cienega Blvd., Los Angeles 46, Calif.

WAUKESHA normal and turbocharged diesel marine engines	Engine Model	Engine Type	No. Cyls.	Bore and Stroke	Displ. Cu. In.	MAXIMUM RATING
						24-Hour Duty
Reliance	Normal	12	8 $\frac{1}{2}$ x 8 $\frac{1}{2}$	5788	665 horsepower @ 1200 rpm	
	Turbo	12	8 $\frac{1}{2}$ x 8 $\frac{1}{2}$	5788	990 horsepower @ 1200 rpm	
Defender	Normal	6	8 $\frac{1}{2}$ x 8 $\frac{1}{2}$	2894	335 horsepower @ 1200 rpm	
	Turbo	6	8 $\frac{1}{2}$ x 8 $\frac{1}{2}$	2894	480 horsepower @ 1200 rpm	
Wanderer	Normal	6	7 x 8 $\frac{1}{2}$	1905	240 horsepower @ 1200 rpm	
	Turbo	6	7 x 8 $\frac{1}{2}$	1905	315 horsepower @ 1200 rpm	
Resolute	Normal	6	6 $\frac{1}{4}$ x 6 $\frac{1}{2}$	1197	195 horsepower @ 1600 rpm	
	Turbo	6	6 $\frac{1}{4}$ x 6 $\frac{1}{2}$	1197	260 horsepower @ 1600 rpm	
Vigilant	Normal	6	5 $\frac{1}{4}$ x 6	779	150 horsepower @ 1800 rpm	
	Turbo	6	5 $\frac{1}{4}$ x 6	779	195 horsepower @ 1800 rpm	
Cutwater	Normal	6	4 $\frac{1}{4}$ x 5	426	100 horsepower @ 2000 rpm	
	Turbo	6	4 $\frac{1}{4}$ x 5	426	120 horsepower @ 2000 rpm	

## New Diesel Cruiser



Many well-chosen features of design contributing to comfort, convenience and originality of line characterize a new 66 foot diesel yacht commissioned early this year for Mr. and Mrs. Reuben C. Carlson of Tacoma, Washington. Mr. Carlson has been an enthusiastic boatman since the age of 18 and the new yacht, the *Miriam*, reflects features of design accumulated over many years of boating in practically all types of craft. The *Miriam* flies the burgee of the Tacoma Yacht Club. The unusual exterior lines of the *Miriam* reflect a functional design influenced by commercial tuna clippers operating off the Southern California coast. A modified clipper

bow, rounded cruiser stern and the V drive installation of her power plant all contribute to ample, uncrowded deck space and a large well-arranged and quiet interior. The craft has a beam of 16 ft, a draft of six ft and is powered by a 289 hp GM Detroit Diesel engine.

The Detroit Diesel power plant selected by Mr. Carlson is a 6-110 unit which gives the *Miriam* a cruising speed of 10.6 knots at 1600 engine rpm. At this engine speed the craft has a cruising range of approximately 1240 nautical miles. The engine installation is unique for a craft of this size. The front

end of the diesel faces aft with the output shaft facing forward. The engine is directly coupled through reverse gears to a Walters V drive unit with three to one reduction gears. A second drive shaft runs aft from the V drive unit and passes under the power plant to a 42 in. x 32 in. Coolidge five-blade wheel. This type of installation places the engine further to the rear of the boat than usual and leaves the best part of the ship—the center—available for living accommodations that are exceptionally free of engine noise and vibration.

Accessories aboard include a 150-watt Apelco radio telephone, a 100-fathom depth finder which can be read both from the pilot house and flying bridge, Photo-Electric automatic pilot with controls located in both handling stations, Hi-Fi radio and stainless steel galley. William Garden, Naval Architect of Seattle, designed the *Miriam* and she was built largely of Alaska yellow cedar by the Tacoma Boat Building Company of Tacoma. The diesel was furnished by the Evans Engine and Equipment Company, Detroit Diesel distributors at Seattle.

### Inspection Device

A new borescope developed by Lenox Instrument Company, 2010 Chancellor Street, Philadelphia 3, Pa., permits complete internal inspection of tanks, vessels, combustion chambers and other equipment by means of an adjustable mirror, which can be controlled by a hand-wheel to permit scanning from retrospective through right angle to forward oblique. The larger field of view offered by the new instrument makes it easier to detect any flaws, pits, cracks or deterioration to assure perfection in manufacturing and maintenance. This Lenox bore-

**VOLTAGE  
REGULATORS**  
for  
ALL A-C and D-C  
GENERATORS

WRITE FOR DETAILS

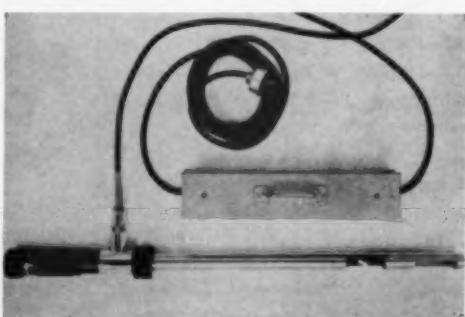
**BROWN BOVERI CORPORATION**  
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Atlanta, Ga. • Birmingham, Ala. • Boston, Mass. • Buffalo, N. Y. • Butte, Mont. • Chicago, Ill. • Cleveland, O. • Denver, Colo. • Detroit, Mich. • Hamilton, O. • Houston, Tex. • Jacksonville, Fla. • Kansas City, Mo. • Knoxville, Tenn. • Miami, Fla. • Minneapolis, Minn. • New Orleans, La. • New York, N. Y. • Pasadena, Cal. • Portland, Ore. • San Francisco, Cal. • Seattle, Wash. • Syracuse, N. Y. • Tucson, Ariz.

Stock the New JSG 1/1 Universal Voltage Regulator. It will control any A-C Generator for 25 to 250 kVA, 1200/1800 rpm.

ITS NEW

If you propose to supply anything—services or products—for use on the diesel, it's a good thing to have some understanding of the engine.



scope gives a magnification of 10 power, a field of vision 9 in. in diameter at a distance of 24 in., and has a viewing head with a  $\frac{1}{2}$  in. diameter 100 watt lamp for illumination. Already in use where gas turbine locomotives travel, and where engines are used for stationary power, such as pumping stations along the trans-Arabian pipe lines in Saudi, Arabia, the new borescope promises to be useful for satisfying today's increased demands on internal inspection. Modifications of this instrument to meet specific applications can be made. For further information on the new borescope, write Lenox Instrument Company, 2010 Chancellor Street, Philadelphia 3, Pa.

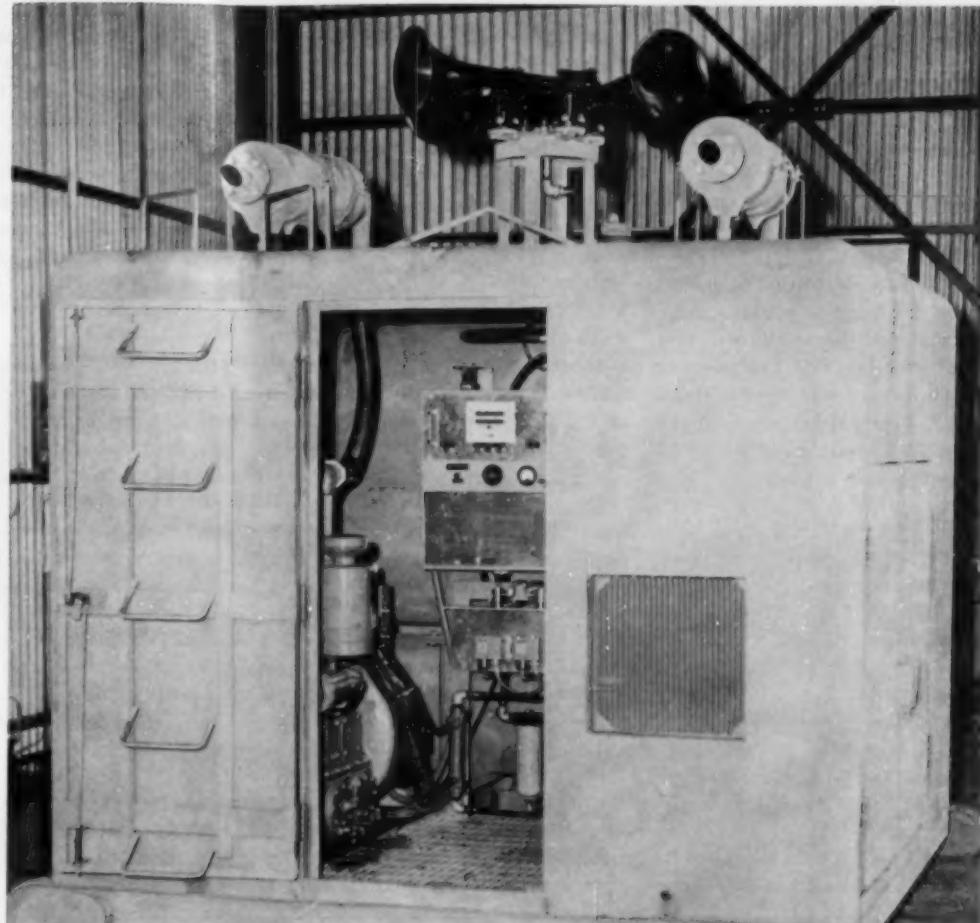
# AUTOMATIC DIESEL AIR COMPRESSOR UNIT

**A**N automatic diesel-air compressor unit, called *Dies-l-air*, has been developed by Nordberg Manufacturing Company and is being produced by them for Automatic Power, Inc., Houston, Texas. The compressor unit has a capacity range of 30 cfm at 60 psi delivery and 26 cfm at 100 psi delivery. The *Dies-l-air* is designed for service in remote areas where commercial power is not available and rugged, dependable service is required. The *Dies-l-air* unit consists of a two cylinder Nordberg Power Chief diesel engine, which has one diesel cylinder converted to an air compressing cylinder. The diesel cylinder head is replaced by a compressor cylinder head but the piston and rings are unchanged.

A concentric type compression valve, which combines both suction and discharge in a single unit, is incorporated in the head. This all hardened steel valve provides a minimum amount of volumetric clearance in the cylinder and a great degree of accessibility. For example, the entire plate valve assembly can be removed without disturbing any cooling water connections or the discharge air hose. The *Dies-l-air* unit operates at 800 rpm and the large radiator has sufficient capacity for effective operation at ambient temperatures of 125° F. A thermostat maintains the jacket water temperature at 180° F. even with light loads. Since the Power Chief cylinder frame is designed to withstand diesel pressures, there is a considerable safety factor for air compressor operation.

Currently, the principal application of the unit is powering a foghorn for installation on navigational hazards, such as off-shore oil well drilling rigs and production platforms. For this type of service, Automatic Power, Inc. uses two *Dies-l-air* units and its dual automatic engine control (DAE-10) to control these units. They are housed in a single, compact steel enclosure which is skid mounted and can be readily hoisted and moved from one location to another. The dual diesel automatic air compressing unit is a complete, independent power package. For unattended operation, a serviceman will fill the fuel storage tank and start one of the Power Chief engines. It will run continuously to maintain a sufficient amount of compressed air in a storage tank. An unloading valve on the compressor cylinder opens when the storage tank

Two Nordberg *Dies-l-air* units, installed in a steel enclosure, have interconnected cooling water systems and are automatically controlled by the Automatic Power, Inc. dual engine control equipment on the right. One of the rugged engines will be kept in continuous operation, supplying compressed air to a storage tank.



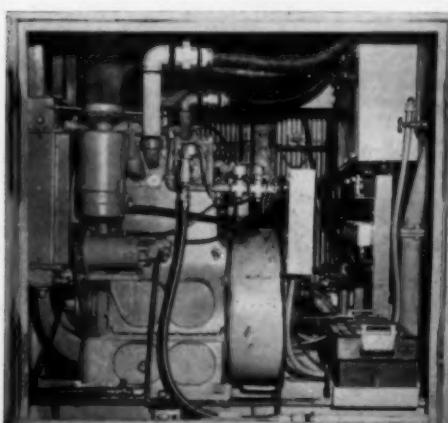
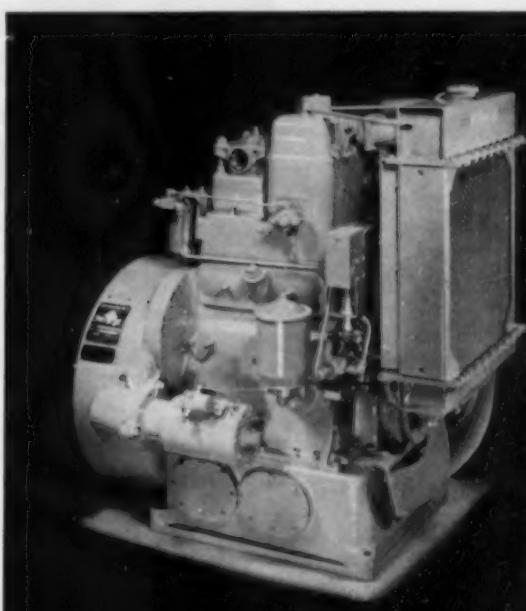
is fully charged and closes when the pressure in the tank reaches a predetermined minimum pressure. During this cycle, the engine governor maintains a constant engine speed of 800 rpm, thereby achieving maximum fuel economy.

Automatic Power Inc.'s automatic control unit is the product of eight years of development and test work. It will monitor the lubricating oil pressure, jacket water temperature, compressed air volume and engine starting-battery charging circuit. If any one of these exceeds an established safe range, the DAE-10 controls will stop the engine and start the standby unit. An interconnected cooling water system between the two engines keeps the standby engine warm for instant starting. The DAE-10 controls not only monitor the engine but an indicator flag will show if any system has exceeded the established safe range. When the serviceman returns after 30 days, he can then make any necessary adjustments or repairs. The *Dies-l-air* unit can be adapted to a variety of uses as either an automatic or manually controlled auxiliary air compressor. The DAE-10 controls can also monitor a 5 kw generator unit which will operate in remote areas, unattended for 30 days. Two, one-cylinder Nordberg Power Chief diesel generator sets replace the *Dies-l-air* engine-compressors in the steel housing. This entire generator unit is insulated and is suitable for operation in areas with extreme ranges of temperature. Inquiries should be addressed to Automatic Power, Inc., 250 Hutcheson Street, Houston 3, Texas.

Two Nordberg *Dies-l-air* units and a dual automatic engine control are contained in this skid mounted, automatic foghorn warning device. It is built by Automatic Power, Inc., Houston, Texas and is designed to operate, unattended, for 30 days in remote locations.

The *Dies-l-air* unit is a two-cylinder Nordberg Power Chief diesel engine, which has one diesel cylinder converted to an air compressing cylinder. The concentric type compression valve combines both suction and discharge in a single assembly. Each unit has a capacity of 30 cfm at 60 psi or 26 cfm at 100 psi.

57



## Northeast Diesel

### Notes

By Arnold B. Newell

THE Higman Towing Company of Orange, Texas, owns 12 diesel tugs and 30 oil barges operating in general towing service between points in Texas and Florida. They have recently equipped two 12,500 bbl barges with Fairbanks-Morse diesels and pumps for cargo handling. These are identical barges 205 ft long, 40 ft wide and 10 ft 10 in. deep, of 802 gross tons. One was built in 1941 and the other in 1956. The pumping units, which were sold by the Dallas office of Fairbanks-Morse, are 4-cylinder 70 hp F-M diesels with Rockford clutches and angle drive for F-M gear type cargo pumps.

THE 70 ft express cruiser, *Pearl Necklace*, has been completed by the Camden Shipbuilding Company of Camden, Maine, to design by Geerd Hendel. She is powered by a pair of Twin General Motors model 6-71 diesels totaling 940 hp, sold by the Hubbs Engine Co. of Cambridge, Mass. Wm. E. Peterson Jr. is the owner. The yacht will carry ketch rig steadyng sails.

A 35 ft steel tug has been completed by Hogdon Bros. of East Booth Bay, Maine

for the Great Northern Paper Co. The propulsion engine is a G-M 6-71 diesel.

THE Gladding-Hearn Shipbuilding Corp. of Somerset, Mass. has delivered the 43½ ft tugs *Dick Perini* and *Charles E. Tirrell* to the Marine Division of the Perini Corp. of East Boston. These boats are dredge tenders powered by General Motors 6-71 diesels driving 5-blade 44 in. diameter by 34 in. pitch Federal bronze propellers thru 4.75:1 reduction gears.

THE YACHT *Voyager* of Greenville, South Carolina has been re-powered by a Mercedes-Benz type OM 636 diesel sold by Daimler-Benz of North America Inc. The *Voyager* is a 45 ft 4 in. sloop and the engine is rated 34 hp.

A Daimler-Benz 34 hp diesel has been installed in the yacht *Wind Song* of New York. This is an auxiliary ketch 49 ft 11 in. in overall length.

A 200 hp Cummins diesel has been sold to the R. J. Brown Towing Company of Pittsburgh, Pa. by Cummins Diesel Engines, Inc. of Philadelphia, Pa. This is a marine model for propulsion service.

FOUR Model HRIP-600 Cummins diesels have been sold to the Bethlehem Steel Company by Cummins Diesel Engines, Inc. of Philadelphia, Pa. The en-

gines are to drive generators on vessels building at the Sparrows Point yard.

PROVIDENCE Hospital of Holyoke, Mass. has purchased a 400 hp Cummins diesel to drive a 200 kw generator for emergency service. The sale was made by Cummins Diesel of New England, Inc., Allston, Mass.

A PAIR of 165 hp Cummins diesels have been sold by Cummins Diesel Engines, Inc. of Philadelphia to the Bethlehem Steel Co. for powering two locomotive cranes.

THE 200-passenger steel sightseeing vessel *Holiday* has been delivered to the Welch Excursion Service, operators of excursions through the Soo Locks between Lakes Superior and Huron. The vessel, which is 64½ ft long, 23 ft beam and 5 ft draft, is powered by a series 6-110 General Motors diesel. Delivery was made via Long Island Sound, the Hudson River and the N. Y. State Barge Canal.

The *Holiday* was built by Blount Marine Corp. of Warren, R. I. and is somewhat similar to the *Bide-A-Wee* built in 1955 for the same owners.

AN interesting type of vessel to be named *Bo-Truc* has been ordered from the Blount Marine Corp. of Warren, R. I. by the George Engine Co. of Harvey, Louisiana. Designed for a speed of

13 mph with 600 hp the vessel resembles a huge cab-over truck. It will be used in off shore supply work in connection with oil drilling and therefore has tremendous stability. A similar vessel has been built for the same owners by Blount.

THE Higman Towing Company of Orange, Texas is having a 1200 hp twin screw towboat built by the Gulfport Shipbuilding Co. of Gulfport, Texas for use in their oil transportation fleet of tugs and barges.

THE FIRST diesel-electric locomotive ever built has been retired and sent to the Baltimore & Ohio Museum by the Jersey Central Lines. It is a 300 hp Ingersoll-Rand unit 32 years old, not worn out but no longer powerful enough for today's needs. General Electric and Alco Products were participants in the development of old No. 1000.

AS THE outcome of successful use of Vapor Phase Cooling of the 880 hp Ingersoll-Rand engines in their Aqua Dulce, Texas plant and the operation of the cooling fan driven by a low pressure steam turbine with steam taken from the cooling system, The United Gas Company of Shreveport, Louisiana has decided to make a similar installation at their new pumping station to be built at Cabeza Creek, Texas.

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AMERICAN MARC  
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THE  
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4



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Complete units for many purposes are also manufactured by American MARC—Diesel generating plants from 3 to 10 KW (AC or DC, and industrial three-phase), Diesel pumping units from 48 to 1700 GPM, marine propulsion, refrigeration units and power-packages for other services. American MARC can adapt any of its Big 4 engines to fit any job requiring from 6.5 to 20 BHP.

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INQUIRIES ARE INVITED FROM QUALIFIED DISTRIBUTORS AND DEALERS.

**HENDRICKSON** Brothers of Valley Stream, Long Island has purchased a 10 in. centrifugal pump driven by a General Motors 3-cylinder diesel from Griffin Equipment Corporation, New York City.

**THE** Waterbury Sand and Gravel Co. of Waterbury, Conn. had a Model 37B Bucyrus Erie shovel repowered by a 4-71 Model 4057C G-M diesel and Snow Nabstdt 1.74:1 reduction gear and clutch sold by Diesel Service Inc. of West Haven, Conn. Ken Neff Sales Engineer and R. H. Cunningham, Service Mgr. supervised the repowering job.

**THE** Morania Oil Tanker Corp. of New York has ordered a 50 ft tug from the Gladding-Hearn Shipbuilding Corp. of Somerset, Mass. to be powered by a Cummins LRM 600 diesel.

**THE** Griffin Equipment Co. of New York City has sold a 200 kw generating set to Mac Lean, Grove Brewster of Roscoe, New York to be used for construction power. The engine is a General Motors, Model 12103.

**THE COYLE** Lines of New Orleans have ordered a twin-screw 1170 hp tow-boat 80 ft in length for river and Intra-coastal Waterway service from the Arnold V. Walker Shipyard of Pascagoula, Miss. Further particulars are not disclosed.

#### Deutz Distributor

The appointment of Diesel, Air-Cooled of Michigan, Inc. of 700 North Street, Big Rapids, Michigan, as distributor for Deutz air and water-cooled diesel engines has been announced by R. D. Friedlander, General Sales Manager of Diesel Energy Corporation, 82 Beaver Street, New York City. Diesel, Air-Cooled of Michigan, Inc. will cover the entire State of Michigan for the distribution of Deutz air and water-cooled diesel engines, manufactured by Kloeckner-Humboldt-Deutz AG. of Cologne, West Germany.

#### West Coast Representative

Young Radiator Company, with plants at Racine, Wisconsin, and Mattoon, Illinois, recently announced the appointment of Flournoy & Everett, Inc. of Downey, California, as Engineering, Sales and Service Representatives for Young Shell and Tube Heat Exchanger products in Southern California. For sixteen years, Flournoy & Everett, Inc. has given the Industrial and Oil Field Division of Young Radiator Company excellent representation. Products handled by this division include HC Atmospheric Radiators, MWC Combination Coolers, Lube Oil and Gas Coolers,

Supercharger Intercoolers, Engine Jacket Water Coolers, Evaporative Coolers, etc. This long association, coupled with the practical and technical knowledge gained, gives them an excellent understanding of the industrial requirements in the great California area they serve. Al Flournoy and Charles Finn, principals of Flournoy & Everett, Inc., have been assured of the complete confidence

of F. M. Young, President, Young Radiator Company. Mr. Young expressed his belief that the addition of their aggressive abilities on the West Coast would expedite service to customers on Young products such as those mentioned above; Shell and Tube Heat Exchangers, Torque Converter Coolers and the broad varied line of Engine Jacket Water Coolers.

**NOW AVAILABLE!** The Brand New **DIESEL ENGINE CATALOG**, Volume 22. This giant, 400 page, 10½" x 13½", fully illustrated reference book containing complete and detailed engine and accessory sections is the biggest and best yet. Mail orders are now being filled for this "Bible of the Industry," which has been revised, rewritten and brought up to date completely from cover to cover. Send your order in now for this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company orders to **DIESEL PROGRESS**, 816 N. La Cienega Blvd., Los Angeles 46, Calif.



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## Michigan-Ohio News

By Jim Brown

A GM Detroit Diesel model 4031C rated at 119 hp has been installed in a Barber-Greene portable asphalt plant for Mr. Frank Strausberg of Saginaw, Michigan. The installation work was done by Peninsular Diesel of Detroit.

A NEW International TD-18 crawler tractor equipped with a hydraulic bulldozer blade has been purchased by Hoag, Cheeseman & Grist of Detroit from the Detroit branch of Wolverine Tractor and Equipment Co.

REITH - RILEY Construction Co. of Goshen, Indiana has accepted delivery on a model D397 and a D311 Caterpillar electric generator set. The two generator sets were delivered by Michigan Tractor and Machinery Co. of Detroit.

WYANDOTTE Chemical Corporation

at Wyandotte, Mich. has accepted delivery on an HD21 Allis-Chalmers crawler tractor. The new crawler is equipped with an all steel cab and a cable operated bulldozer. The sale was made by Earle Equipment Co. of Detroit.

CUMMINS Diesel Michigan, Inc. has installed a model NHB-600 Cummins in an LJ Mack truck for the Concrete Block and Products Co. of Detroit.

A MODEL 34 Lima crane has been converted for the Ottawa County Road Commission from gasoline to diesel. Peninsular Diesel of Detroit used a model 4055C GM Detroit Diesel for the job.

THE BLUE Water Excavating Co. of Port Huron, Mich. has accepted delivery on three International 2T-55 Payscrapers and an IH TD-24 crawler tractor equipped with a cable 'dozer and a front mounted winch. The new equipment will be broken in on road construction (M-38) near Mayville, Michigan. De-

livery was made by the Detroit branch of Wolverine Tractor and Equipment Co.

A NATURALLY aspirated model D342 Caterpillar diesel rated at 200 hp was used by Michigan Tractor and Machinery to repower a 2 yd Lima shovel for the State of Michigan.

AN Allis-Chalmers HD-16 crawler tractor equipped with a hydraulic 'dozer blade has been delivered to Clinton County Road Commission by Earle Equipment Co. of Detroit.

VAN Kampen Bros. of Allen Park, Mich. are installing a model NHB-600 Cummins diesel in one of their LJ Mack trucks. The diesel was purchased from Cummins Diesel Michigan, Inc.

R. G. MOELLER Co. of Detroit is installing an International UD14A diesel in a Super 99 Austin-Western grader for Solomon & Sons of Pontiac, Mich.

delivery on a model 303 Galion Motor Grader. The grader is powered by an International model UD-264 diesel and was purchased from the Grand Rapids branch of Wolverine Tractor & Equipment Company.

FIVE DW-21 tractors with new 470 scrapers were recently added to Holloway Construction Company's fleet of Caterpillar equipment at Livonia, Mich. The new Cat Lowbowls were purchased from Michigan Tractor & Machinery Co. of Detroit, and will be broken in on a highway construction job (US-16) between Detroit and Lansing.

A MODEL 88-L Austin-Western grader complete with scarifier and bulldozer blade and powered by a GM 3-71 Detroit diesel was delivered to the City of Detroit by R. G. Moeller Co. of Detroit.

### Diesels For Marine Corps

American Marc, Inc., leading producers of lightweight diesel engines, has been awarded contracts totaling \$1,000,000 by the United States Marine Corps for the production of lightweight, long-life diesel generating sets. Denis Kendall, president of the company, announced recently. These sets, to be used in the electronic and communications fields by the Marine Corps, will be powered by 3 hp and 1½ hp diesel engines. The basic 3 hp engine weighs only 16 lbs, and, when coupled to a 400 cycle generator will produce 1½ kw of electricity continuously in a 45 lb package. The featherweight engines will be made entirely with aluminum. Arthur Vining Davis, chairman of the board of the Aluminum Company of America, is the principal stockholder in American Marc.

CRAWFORD County Road Commission in Grayling, Mich. has accepted delivery on an International TD-18 equipped with a P-25 Winch and cable bulldozer. The sale was made by Wolverine Tractor & Equipment Co. of Detroit.

THE RADIO station WWJ in Detroit has a new model D326 Caterpillar standby generator set. The set is rated at 100 kw and was purchased from Michigan Tractor & Machinery Co. of Detroit.

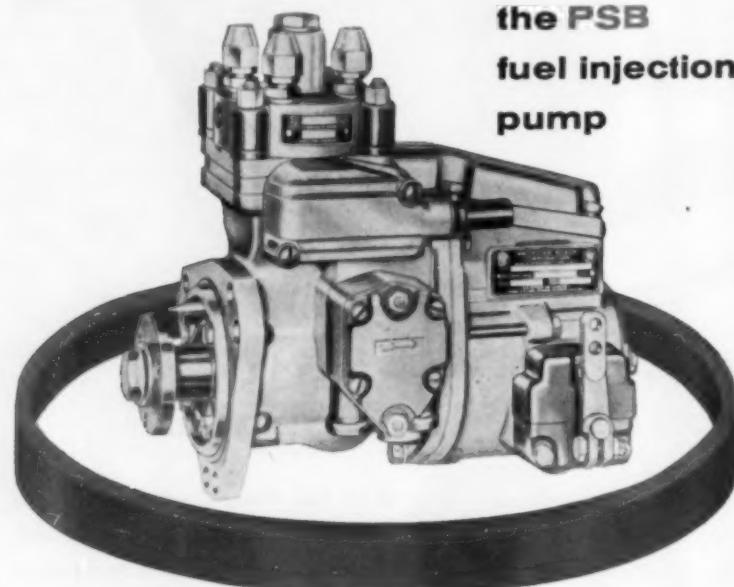
AN Allis-Chalmers model HD11B crawler tractor rated at 150 net engine hp has been purchased by Mr. William J. Roberts of Three Rivers, Mich. from the Earle Equipment Co. of Detroit.

HOME CITY Iron & Metal Co. of Springfield, Ohio has accepted delivery on a model LS-68 Link-Belt Magnet Crane equipped with a ¾ yd bucket. The crane is powered by a model 3030C series 71 GM Detroit diesel and was purchased from the Flack Equipment Company of Dayton, Ohio.

A MODEL NHB-600 Cummins diesel was recently installed in an LJ Mack for Superior Transportation of Bay City, Michigan. Cummins Diesel Michigan, Inc. reports that this is the 16th diesel that they have installed for this company.

PENINSULAR Diesel of Detroit has installed a model 6031C GM Detroit diesel rated at 182 hp in an Austin-Western Rock Crusher for Souter Sales Co. of Detroit.

NEWAYGO County Road Commission at Whitecloud, Michigan has accepted



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fuel injection  
pump

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4847

## West Coast News

By James Joseph

BECHTEL Corp., San Francisco, has taken delivery of six 3 cyl., Model 49, 110 hp Fairbanks-Morse diesel units.

TO POWER the M/V *Kingfisher*, an Allis-Chalmers DAMR-1125 diesel, a BD-77 diesel has been installed in the same vessel as auxiliary. Sales reported by Pacific Fishing & Trading Co., Seattle.

SAHLBERG Equipment Co., Seattle, has purchased two Allis-Chalmers MO-993 power units for two Cedar Rapids rock crushers.

FOR ITS Barber Greene pug mill, Seattle's S. Birch & Sons has purchased a GM model 6030C open power unit from Evans Engine and Equipment Co., Inc.

JUNEAU, Alaska's Roy Opheim has re-powered his gillnetter with a GM 3072C marine engine.

MAGNUS Martens, Petersburg, Alaska, has powered his halibut boat *Pamela Rae* with a new Roots Blower Model 62206RD 6-110 General Motors diesel and reports substantial increase in speed.

REPOWERING from gasoline to diesel, the salmon troller *Hazel H*, operating out of Seattle, has installed a Model 45200 4-51 GM diesel engine.

TO EL CERRITO, Calif's Tool Equipment Rental, Inc., two 4 cyl. Model 49B41/2, 95 hp diesel engines from Fairbanks-Morse.

TO INDUSTRIAS Unidas del Pacifico, S. A., Mexico, a 6 cyl. Model 38F51/4, 450 hp Fairbanks-Morse diesel. Same company recently took an F-M 7 cyl. Model 38F51/4 525 hp engine.

AS AUXILIARY for the vessel *Virgin Mere*, out of Seattle, an Allis-Chalmers BD-77 diesel.

FOR THE M/V *Bernice R* of Seattle, an Allis-Chalmers DAMR-844 diesel. Sale reported by Pacific Fishing & Trading Co.

SOLD TO 13th Coast Guard District, Seattle, a Fairbanks-Morse 51/4 hp. Model 45C31/2 diesel engine.

PUGET Sound Bridge & Dredge Co., Seattle, has purchased a GM 6-71 Quad Model 24103 power unit for a dredge.

REPOWERING from gasoline, Albert Wallace, Juneau, Alaska, has equipped his salmon troller with a Model 3072, 3-71 GM diesel.

M. J. SVORINICH, Seattle, has taken delivery of a GM 6-110 diesel for his purse seiner abuilding in Seattle.

### Branch Manager Named

The appointment of C. L. McDougall as Branch Manager of the Cooper-Bessemer field office at Odessa, Texas, has been announced by A. A. Burrell, Vice

President and Southwestern District Manager. In his capacity as Branch Manager, Mr. McDougall will direct Cooper-Bessemer's field sales and service activities in the West Texas area to continue close engineering contact between the factory and Cooper-Bessemer customers. Mr. McDougall's assignment fills the position left by A. Abel, former Odessa Branch Manager, who has taken

up a new Cooper-Bessemer post as Branch Manager at Tulsa, Oklahoma.

Working with Mr. McDougall is Mr. W. J. Burkstaller, recently appointed to Odessa as Sales Engineer. In his position, Mr. Burkstaller will concentrate his activities on the application of engine-driven and motor-driven compressors in West Texas.

## Billions of hours . . . of trouble-free operation!

that's the service record of **ELLIOTT** turbochargers



For nearly 20 years, Elliott has designed and manufactured turbochargers that are successfully serving diesel engines all over the world. Their high-pressure delivery improves engine performance, output and operation. The secret of their remarkable high-quality performance is *simple design, and rugged construction*.

Engineered for many hours of steady, dependable service, Elliott turbochargers provide pressure ratios up to 3.0 and flows of 400 to 14,000 cfm. The superior design permits easy accessibility for routine cleaning and maintenance. Covering the field of turbocharged engines, Elliott turbochargers serve locomotives, ships, drilling rigs, generating plants, pipeline stations, trucks, tractors, busses, etc. Write today for further engineering data.

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## Inland River Reports

By A. D. Burroughs

WE MIXED considerable pleasure and inland river business with a vacation routing through the south. Southern shipyards are producing at a good rate and enthusiasm regarding diesel propulsion has hit a new high.

THREE new twin-screw towboats have been completed at Lemay, Mo., by the Barbour Metal Boat Works. A 60 x 21 footer, the *Timmy*, a neat craft powered with a couple of GM (Detroit) 6-110's has been delivered to the Campbell Barge Line, Pittsburgh.

THE KANAWHA Sand Company, Parkersburg, W. Virginia received the Barbour production, the *Belpre*. This towboat measures 58 x 17 ft, powered with two GM 6-110's, is similar in appearance to the *Vienna*, a Kanawha vessel now leased out for duty on the Tennessee River.

THE NAME of the third Barbour towboat was at the time undecided but it will serve owners Memphis Boat Supplies, Inc., with propulsion power from the twin GM 6-110's at Memphis, Tenn.

MATERIAL Service Corporation, Lock-

port, Ill., has placed an order for a towboat with a retractable pilothouse with Barbour. This is Barbour's first order for a retractable pilothouse and interest is keen. The ordered craft is to measure 70 x 21 ft, with power, again from GM 6-110's.

THE triple-deck towboat, *Bobby*, 65 x 20 ft, has been delivered to owners West Bank Towing Company by another southern yard, Marine Construction Co., Patterson, La. Power comes from twin GM diesels.

WE'D SEEN the *Jean Frances* on the Ohio with a good tow, and learned that this 1000 hp towboat has been purchased from LaFourche Towing Company to become a member of the "Bayou Fleet" owned by Oil Transport Company, New Orleans, and will be renamed *Bayou Velerie*. Caterpillar engines supply the main engine power for this popular vessel.

HORN'S Boat Shop, Shreveport, La., marked up their 30th craft as the *Judy M* was completed for delivery to Jefferson City, Mo. It is powered with GM (Detroit) diesels for the 300 hp.

CUMMINS engines power the new twin-screw 750 hp *Aubrey Saucer*. This 60 x 20 ft towboat constructed by Saucer

Marine Service, Inc., New Orleans, is now in active harbor service at Cairo, Ill., for owners Cairo Harbor Service.

craft is powered by two Cooper-Bessemer JS-8-T four-cycle engines for the total 2480 hp.

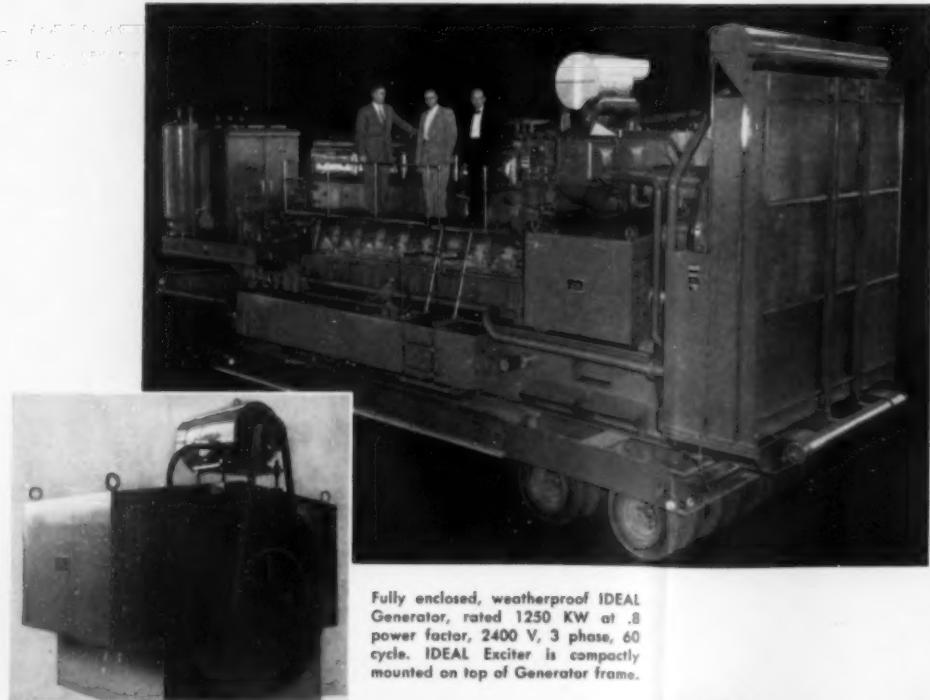
FAIRBANKS-Morse OP engines equip the powerful new *Laura Lee*. The air conditioned triple-screw towboat recently completed at St. Louis Shipbuilding and Steel Co., measures 156 x 50 ft, is equipped with Kort Nozzles, and will put its 4800 hp to service for owners Upper Mississippi Towing Corporation.

THE GRAFTON Boat Works, Ill., has scheduled the delivery of a 300 hp steel hull towboat around September 1 to George A. Mason. A pair of Allis-Chalmers diesels will provide the power for this craft designed to be used as a barge-switcher.

THE well-known *Inca*, with 1800 hp from Superior engines, has the new name *Barbara Lee*; the new owners are Gulf Transportation Co.

IN ANSWER to mail inquiries, the *Vance* has 150 hp, delivered by a Buda diesel, is owned by the Moline Consumers Co. The *Sallie H.* was sold to Igert, Inc., Ky., with 120 hp from a Worthington engine, and *Little Alex*, owned by Pittsburgh Consolidation Coal Co., is powered with a Murray and Tregurtha Harbormaster.

## World's Largest Truck Trailer Power Plant has IDEAL GENERATOR



Fully enclosed, weatherproof IDEAL Generator, rated 1250 KW at .8 power factor, 2400 V, 3 phase, 60 cycle. IDEAL Exciter is compactly mounted on top of Generator frame.

The IDEAL ELECTRIC  
& Manufacturing Co., Mansfield, Ohio



This 80-ton "packaged" power unit (Composed of truck, trailer, and diesel-powered electric generating plant) was built for use on heavy construction projects in Venezuela. The unit is designed to give completely dependable service under the most severe weather and working conditions.

IDEAL supplied the weatherproof Generator and Exciter. Control of the 39-ft. power plant is achieved thru the IDEAL weatherproof Switchboard mounted forward of the engine. Congratulations to White Motor Company on an outstanding achievement.

IDEAL Engineers welcome the opportunity of working with you on all types of applications requiring Electric Power Generation and Electric Motors. Write today.

## Gulf Coast Diesel Notes

By Michael T. Pate

HILLMAN-KELLY Company, Houston, has bought for application on automatic pipe tongs one model 180DLCU Waukesha diesel, rated 33 hp at 2000 rpm. Sale was made by Waukesha Sales & Service, Inc., of Houston.

BROWN & ROOT, Inc., Houston, has bought from Big 3 Welding Equipment Company, Houston, six 300 amp model 7068 Lincoln welding generators, each powered by a 2-cylinder, series 71, model 2055 General Motors diesel, for delivery to its Houston plant; and a like number of units for delivery to its pipeline construction operations on the Louisiana coast.

WINN-HAWKINS Company, New Iberia, Louisiana, has secured from Waukesha Sales & Service, Inc. of Houston, a model 135DKU Waukesha diesel, rated 106 hp at 1800 rpm.

GULF MASTERS Boat Company, Venice, Louisiana, has obtained from Cummins Sales & Service, Fort Worth, Texas, two model NRT-6-M, 300 hp Cummins diesels, to be installed in a 45 ft steel crew boat.

WICHITA Welding Company, Wichita Falls, Texas, has bought from Waukesha Sales & Service, Inc., Houston, two model 180DLCU Waukesha diesels, each rated 33 hp at 2000 rpm, which will be used for driving welding generators.

TELLEPSSEN Construction Company, Houston, had bought from Big 3 Welding Equipment Company, Houston, four 300 amp Lincoln welding generators, each driven by a two-cylinder series 71, model 2055 General Motors diesel.

SALT WATER Controls, Inc., New Iberia, Louisiana, has taken delivery of a model 180DLCU Waukesha diesel, rated 33 hp at 2000 rpm, which will be used to drive a desander. The diesel was furnished by Waukesha Sales & Service, Inc., of Houston.

WESTERN Constructors, Inc., Jena, Louisiana, has obtained from Big 3 Welding Equipment Company, Houston, two Lincoln welding generators, each powered by a model DIX4D 4-cylinder Hercules diesel. The units will be used on the company's pipelaying operations.

HOUSTON Oil Field Material Company, Inc., Houston, has bought from Waukesha Sales & Service, Inc., Houston, a model 135DKU Waukesha diesel

which will be utilized to drive oilwell equipment. The diesel is rated 106 hp at 1800 rpm.

HOUSTON Contracting Company, pipeline contractor of Houston, has bought from Big 3 Welding Equipment Company, Houston, two 250 amp Lincoln welding generators, each powered by a model DIX4D Hercules diesel. The

units will be used in general pipeline welding service.

NATIONAL Potash Company, Hobbs, New Mexico, is repowering another of the jeeps in its underground workings with a model 180DLC Waukesha diesel, rated 45 hp at 2400 rpm. The diesel was furnished by Waukesha Sales & Service, Inc., of Houston.

**NOW AVAILABLE!** The Brand New DIESEL ENGINE CATALOG, Volume 22. This giant, 400 page, 10½" x 13½", fully illustrated reference book containing complete and detailed engine and accessory sections is the biggest and best yet. Mail orders are now being filled for this "Bible of the Industry," which has been revised, rewritten and brought up to date completely from cover to cover. Send your order in now for this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company orders to DIESEL PROGRESS, 816 N. La Cienega Blvd., Los Angeles 46, Calif.



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**Giyes Thompson Turbochargers More Capacity at Lower Speeds**

Only Thompson Turbochargers have simple, straight rotor vanes which provide the economy of high-pressure supercharging at low rotor speeds. This compact, simplified design is based on the Jet Division's years of experience with air- and gas-powered air compressors. Air-foil vane sections of the turbine and compressor wheels have been developed in the Jet Division lab.

In new Thompson Turbochargers you'll find many other ways in which aircraft performance has been combined with automotive simplicity and ruggedness. One-piece bearings simplify maintenance . . . rugged turbine design means longer life . . . compact, space-saving design facilitates installation.

New Thompson Turbochargers are available in sizes to efficiently blow diesels from 50 to 300 horsepower. Our engineers will welcome an opportunity to show you how Thompson Turbochargers can help you achieve up to 100% increases in horsepower, with a reduction in fuel consumption.

**JET DIVISION**  
**Thompson Products, Inc.**  
Cleveland 17, Ohio



Write on your company letterhead for Booklet DPR-237, containing detailed information on Thompson Turbochargers.

## Midwest Diesel News

By L. H. Houck

COTTON BELT, St. Louis Southwestern Railway, has ordered six 1750 hp GM diesel locomotives from the Electro-Motive Division at LaGrange, Ill., according to H. J. McKenzie, president. Cost is \$1,140,000 and delivery is scheduled for October. The new units are additional units since the railroad has been completely dieselized for the past four years.

WILSON Truck Co., Nashville, has bought the Simpson Truck Lines, St. Louis, and the rolling stock will be converted to Mack B-65 diesel tractors to standardize it with Wilson equipment which placed 250 similar diesel units in service last year.

ELMER LOGSDON, Beardstown, Ill., has bought a 300 hp NRT-6-M Cummins Turbodiesel from Cummins Diesel Sales Corp., Peoria.

COOPER-BESSEMER has opened a new service and parts warehouse for its diesels and compressors at Casper, Wyoming. Owen Lawrence, field service engineer, is in charge.

JEROME SLATTERY, Mt. Leonard, Mo., has taken delivery on an Allis-Chalmers HD-9 with dozer and Buda Division diesel, from Cooke Sales & Service, Sedalia, Mo.

JORDAN EQUIPMENT Co., South

Bend, Ind., is a new LeRoi dealer, covering about 25 counties, handling LeRoi portable compressors which run up to 600 cfm with diesel drive and the LeRoi Tractair 42 hp wheel tractor and 125 cfm compressor.

G. W. THOMPSON, Cropsy, Ill., has installed a JT-6-B 175 hp Cummins Turbodiesel from Cummins Diesel Sales Corp., Peoria, in a truck.

R. G. ALDRIDGE Construction Co., who has a US 50 rerouting job near Kansas City, added to his Fleet a Caterpillar D8, with self-contained air-compressor and two rock drills.

COOPER Contracting Co., Mooresville, Mo., bought a D-315 Caterpillar diesel unit from Midland Tractor Co., Chillicothe, Mo., for powering a gravel plant.

HOLCOMB Township of Dunlin County, Mo., has taken delivery of an Allis-Chalmers Model 45 motor grader from Ryan Equipment Co., St. Louis.

GENERAL Excavating Co., Belleville, Ill., has purchased an HD-6G Allis-Chalmers from Ryan Equipment, St. Louis, and it is working on the Mississippi River sealwall job.

CUMMINS Missouri Diesel Sales Corp., St. Louis, has delivered a Cummins JF-6-P 105 hp diesel to the Charles Friend Lumber Co., Licking, Mo., for powering a sawmill.

PARDIECK Sales and Service, Seymour,

Ind., has delivered a Case Terratrac crawler with dozer and Continental diesel to Williams Richards, Nineveh, Ind., for use in farm cultivation.

A WAGNER four wheel tractor on rubber, made in Portland, Ore., has been delivered by the Seymour, Ind., dealer, Pardieck, to Obermeyer Farms, Francisville, Ind. It has a 110 hp Cummins diesel.

RENFRO Drilling Co., Wichita, Kansas, has purchased a 12103HD GM diesel for installation on a new National drawworks. Sale was made by Diesel Equipment Co., Inc., Wichita, through National Supply Co.

FIELD QUEEN, Inc., Maize, Kan., has purchased three 3031C LH General Motors diesels for installation in their Field Queen alfalfa cutter. Sale was made by Diesel Equipment Co., Inc., Wichita and Great Bend.

SMITH SAND CO., Garden City, Kan., has bought a 2-71 GM diesel for installation in an Allis-Chalmers HD-5 tractor. Sale was made by Diesel Equipment, Co., Inc., Wichita and Great Bend through Power Equipment Co., Dodge City.

STERLING Drilling Co., Sterling, Kan., has taken delivery of two Model 62408 GM diesels with Allison torque converter for installation on a U-10 tractor. Sale was made by Diesel Equipment, Inc., GM dealers in Wichita and Great Bend.

REID-HOLCOMB Co., Inc., Euclid dealer, has opened a new branch at Evansville, Ind., with T. W. "Red" Hamlin as manager and Max Farrar as parts manager.

JOY GITHENS, Poplar Bluff, Mo., has taken delivery on an Allis-Chalmers HD-16 tractor with torque converter from Ryan Equipment, Sikeston, Mo.

### Kenworth Trucks Purchased

Addition of 14 Kenworth Model 521 Cab-Beside-Engine units to the fleet of Fortier Transportation Company with headquarters at Fresno, California, is announced by Lewis T. Gerlach, general sales manager, Kenworth Motor Truck Company. The newest diesel-powered Kenworth units for the Fortier Transportation network are single rear axle drive with a two-speed rear axle. Kenworth's easy-ride stabilizer incorporated in this design resists sway, equalizes the load and assures a level, easy ride with flexible, bus-type springs.

Fortier Transportation Company operates more than 1,000 pieces of highway

equipment throughout the State of California as both a common and contract carrier. Established in 1912, the firm's diversified operations include daily scheduled common carrier, less than truck load, general commodities hauling. It also provides services for the transportation of petroleum products; liquefied and bulk granulated sugar; raw cotton and cotton seed; heavy equipment for construction and oilfield work; fresh produce, canned and refrigerated foods; brandy and quality vintages by special tanker; ammonia nitrates and other chemicals. The order for the 14 CBE Kenworths was placed through the Fresno branch of J. T. Jenkins Company, Kenworth distributor for California, Nevada, Arizona, New Mexico and Western Texas.

### 10,000 lb Lift Truck

Production has started at the Harvey, Ill., Works of the Allis-Chalmers Manufacturing Co., Milwaukee, Wis., on a new 10,000 lb capacity lift truck, The FT-100. This new truck is designed for heavy-duty work characteristic of steel mills, factories, warehouses, stevedoring, and any other place where heavy loads have to be handled. The FT-100 has a heavy-duty, welded industrial-type frame that assures complete alignment of parts and means long life and low maintenance. The 230 cu in. Allis-Chalmers engines, available in diesel, gasoline or LP gas fuel models, provide the high torque at normal engine speed that is needed for heavy work and up grades.

A new roller type "extra lift" mast that gives more lift without increasing the overall lowered height of the unit is available in three standard heights. The standard ITA shaft-type fork mounting carriage permits the use of a wide range of standard attachments, plus those built to order for specific material handling requirements. The truck has a 2-speed, constant mesh transmission that provides easy shifting. Power shift transmission, power steering, and a No-Spin Differential are available as optional equipment. Maximum traction for practically all working conditions is provided by the No-Spin Differential, which is also available for Allis-Chalmers trucks from 3,000 to 8,000 lbs capacities.

ITS NEW

### Diesel-Electric Sets

Three new portable diesel electric sets have been announced by Caterpillar Tractor Co. The new units are the Caterpillar D311, D315 (Series G), and D318 (Series G) diesel electric sets, each equipped with the new, compact Caterpillar generator. The D311 Electric Set develops 30 kw of 60-cycle, 3-phase current, while the D315 (Series G) electric

&lt;img alt="Advertisement for KATO GENERATORS. The ad features a large image of a generator unit with a flexible coupling. Text includes: 'KATO GENERATORS Fit The Engine Of Your Choice!', 'CHOICE OF FLEXIBLE COUPLINGS Adaptable to ALL ENGINES with SAE Bell Housing', 'There is a size in the Kato line of generators with the electrical characteristics to meet your specific requirements. By means of one of Kato's flexible steel, disc-type couplings, as illustrated, Kato generators easily connect to any diesel or gasoline engine. All standard frequencies . . . 25, 50, 60 and 400 cycles, plus many special frequencies . . . 120, 180, 240, 360, 480, 600, 720, 840, 960, 1080, 1200, 1320, 1440, 1560, 1680, 1800, 1920, 2040, 2160, 2280, 2400, 2520, 2640, 2760, 2880, 2960, 3040, 3120, 3200, 3280, 3360, 3440, 3520, 3600, 3680, 3760, 3840, 3920, 4000, 4080, 4160, 4240, 4320, 4400, 4480, 4560, 4640, 4720, 4800, 4880, 4960, 5040, 5120, 5200, 5280, 5360, 5440, 5520, 5600, 5680, 5760, 5840, 5920, 6000, 6080, 6160, 6240, 6320, 6400, 6480, 6560, 6640, 6720, 6800, 6880, 6960, 7040, 7120, 7200, 7280, 7360, 7440, 7520, 7600, 7680, 7760, 7840, 7920, 8000, 8080, 8160, 8240, 8320, 8400, 8480, 8560, 8640, 8720, 8800, 8880, 8960, 9040, 9120, 9200, 9280, 9360, 9440, 9520, 9600, 9680, 9760, 9840, 9920, 10000, 10080, 10160, 10240, 10320, 10400, 10480, 10560, 10640, 10720, 10800, 10880, 10960, 11040, 11120, 11200, 11280, 11360, 11440, 11520, 11600, 11680, 11760, 11840, 11920, 12000, 12080, 12160, 12240, 12320, 12400, 12480, 12560, 12640, 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set is rated at 40 kw, and the D318 (Series G) electric set at 60 kw. These highly mobile units are available either skid-mounted or with running gear, and the output of their self-regulated, constant-voltage generators furnishes a choice of 120, 240, 120/208 or 480 volt current at 1800 rpm. Standard equipment on the sets includes 24-volt, 18-ampere charging generators and 24-volt, 170 ampere-hour battery sets. The power units also come equipped with 24-volt direct electric starting, wrap-around bases, control panels and water temperature-oil pressure safety shut-offs. The two smaller sets have 50-gal. fuel tanks, and the D318 (Series G) has a 57-gal. fuel tank.

Control panels for the new electric sets have an ac ammeter with phase selector switch, ac voltmeter, battery charging ammeter, circuit breaker, and three current transformers. In addition, the electric set packages include radiators, blower fans, lubricating oil coolers and vernier-type governor controls. Designed into all three units are features intended specifically for the safety of operating personnel. The control panels are enclosed, and flexible conduit protects all wiring so that no high voltage is exposed. The control doors can be locked to prevent tampering, and switchgear is enclosed under weatherproof covering, by doors that may be closed in bad weather. There is a safe terminal board for load leads, and a grounding lug for completely safe operation.

Several attachments have been made available to increase the versatility of the new portable electric sets. These include 110-volt, 15-ampere outlet receptacles, running gear equipped with mechanical parking brakes, and, for easy starting in temperatures down to 0°F, glow plugs or ether starting aids. For convenience of operation, controls and gauges, including the governor controls, engine instruments, electrical meters and circuit breakers, are located on the control panel. When on running gear, all three units have low centers of gravity, and roll on 7:00 x 14.5-8 ply tubeless tires. The highly mobile units can be started and controlled from their instrument panels. All three units are easy to service and the terminal boards are readily accessible. Battery servicing is made simple through utilization of an access door located below the control panel.

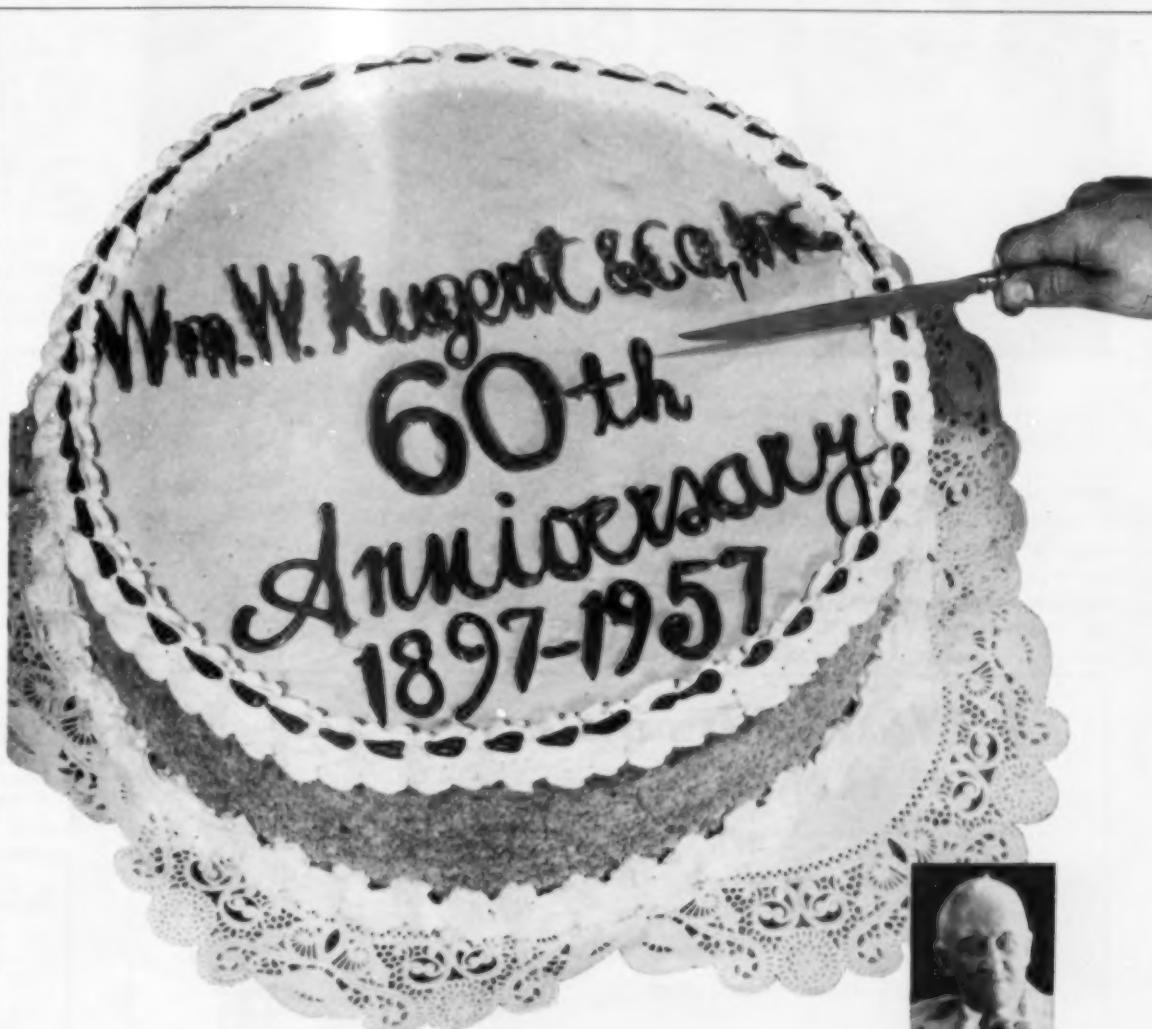
ITS NEW

Capt. Lamb has been Chief Engineer of the firm for the past two years. Mr. Jack Princing DeShinsky is appointed Chief Engineer succeeding Capt. Lamb. Mr. DeShinsky graduated from Purdue in 1932 with the degree of BSME. After graduating and until 1946, except during World War II, when serving in the U. S. Navy as a Lieutenant for engineering duty, Mr. DeShinsky was employed

as a steam, inspecting, research and hydropower engineer in the following companies: General Abrasive Company, Electrometallurgical Company and The Austin Company. He left Avondale Marine Ways, where he had served from 1946 successively as Assistant Chief Engineer and Chief Mechanical Engineer, in April 1957 to join Friede & Goldman. Mr. DeShinsky is a member of the

Society of Naval Architects and Marine Engineers, Gulf Section and of the Propeller Club of the United States, Port of New Orleans.

Never did know anyone who could take a gander at the exhaust and learn as much about what's going on in the cylinder as the fellow who takes a reading with a pyrometer.



W.M. NUGENT  
Founder



CORLISS D. NUGENT  
President



WM. WARREN NUGENT  
Secretary

## Before we cut the cake...

Wm. W. Nugent & Co., Inc., on the occasion of its sixtieth anniversary, wishes to express its sincere appreciation for the confidence and loyalty toward Nugent products, demonstrated by an ever increasing acceptance throughout industry.

For three generations, Nugent products have embodied only highest quality design, materials and workmanship. The future shall find no compromise with that policy.



Wm. W. *Nugent* & Co., Inc.  
3441 Cleveland Street  
Skokie, Illinois

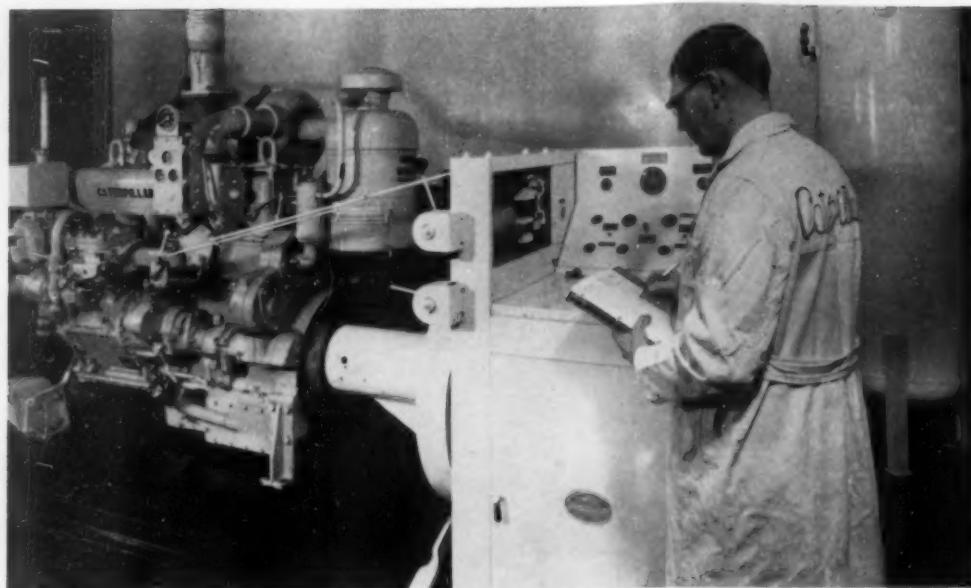
OIL FILTERS, OILING AND FILTERING SYSTEMS, TELESCOPIC OILERS, OILING DEVICES, SIGHT FEED VALVES, FLOW INDICATORS

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### Friede & Goldman Appointments

V. M. Friede, President of Friede & Goldman, Inc., Naval Architects & Marine Engineers of New Orleans, announces the appointment of Carl J. Lamb as Assistant to the President.

## Engine Testing Facilities



Caterpillar turbocharged engine being tested on Finning Tractor and Equipment Company's Clayton dynamometer.

Complete engine testing facilities are now available to customers of Finning Tractor & Equipment Co. Ltd., Vancouver, British Columbia, Canada. This newest service went into effect recently with installation of complete dynamometer facilities in the Vancouver Service Shops. The new equipment

is a 500 hp capacity Clayton dynamometer, electrically controlled, with its own heat exchanger. It is housed in a compact, specially designed room.

Industrial engines, marine units, tractor engines from used equipment and customer overhaul jobs

will all be processed through the dynamometer room. In addition special equipment, such as turbochargers, will undergo complete testing before delivery. Advantages and benefits will be two-fold.

Complete customer satisfaction is assured because all engines will be thoroughly tested under full load, and service charges will be reduced because minor complaints, now requiring costly service calls, will be revealed and remedied during the test period.

In testing, engines are first run for half an hour under no load. They are then progressively stepped up to quarter and half loads and constantly checked for loose bolts, loose connections, oil consumption, etc. The engine is then operated under full load and run continuously for four hours. The attendant mechanic, who supervises all dynamometer tests, checks fuel rack settings, water and oil temperature, oil and fuel pressure and closely checks operating performance. Specially designed quarters were built to house the dynamometer. Triple glazed windows permit customer viewing. Engine exhaust fumes are piped out and room air is controlled by a ventilation system. To eliminate excess pipe and wiring and to permit easy access to the engine, a cooling tower was installed to control inlet and outlet water at constant temperature. This tower also eliminates the need for radiators or fans. Most of the water and fuel connections were sunk in the concrete floor. All units are started by an air motor to avoid the use of gas in a closed room.

### A *Channelcromed* Diesel Engine Liner

Twenty-two hundred and fifteen Diesel-electric locomotive engine liners Channelcromed in 1955 and 1956, without even one failure, and with an all-time low in the rate of lubricating oil consumption.

Ask for new Bulletin 76

PENNINGTON CHANNELCROMIUM COMPANY

319 Dakota St., San Antonio 3, Texas



ELECTRICAL ENGINEER to take charge of Municipal Electric Utility. Installed diesel capacity 2170 KW and hydro 350 KW. 1250 KW to be added. Distribution or generation experience desirable. Located in the center of the lower peninsula. Apply to City Manager, City Hall, St. Louis, Michigan.

America's Largest GM fuel injector rebuilders

Interstate  
diesel service incorporated

2093 East 19th Street • Cleveland 15, Ohio

Products sold exclusively through dealer and distributor organizations throughout the United States and Canada. Dealer inquiries welcome

### MODERN SLOW SPEED

DIESEL ELECTRIC  
GENERATOR SETS

- 600 RPM—Worthington BB5  
100kw 3/60/480
- 300 RPM—Fairbanks Morse 33F16  
1125kw 3/60/480

Complete With All Auxiliaries

Other Sets From 20kw to 1200kw

### DIESEL DIVISION

National Metal & Steel Corp.  
TERMINAL ISLAND (Los Angeles Harbor), CALIF.  
PHONE: NEvada 6-9871

**HILCO**

FULL FLOW or BY-PASS FILTERS

DIESEL ENGINE LUBE AND FUEL  
OIL FOR EVERY MAKE AND SIZE  
ENGINE . . .

CLEAN OIL - CLEAN ENGINES

★ WRITE FOR FREE LITERATURE

THE HILLIARD CORP. 122 W. FOURTH ST. ELMIRA, N. Y.  
IN CANADA—UPTON-BRAEEN-JAMES, LTD.—890 YONGE ST., TORONTO—8760 VERVILLE ST., MONTREAL

Main base for the engines is two I-beams with the bottoms of the I's embedded in the floor. This base will support even the largest V-type engines—the D397 and D375. Portable dollies have been built to transport all engines from the D311 to the D353 in size. They are equipped with casters and the units can be mounted in any part of the plant and wheeled into the dynamometer room. The installation was made under supervision of Merchandising Manager S. J. Crowe, Specialized Services Manager Ted Mitchell, and Dave Garthwaite, Engineering Department. In a far flung territory like British Columbia, this new service means a great deal. If a customer reports a complaint on a newly purchased used engine, Finning's serviceman may have to fly 500 miles up the coast to repair what may only turn out to be a pinched fuel line or bent gasket. Now, the dynamometer will be the "ounce of prevention" that's worth more than the "pound of cure."

#### Governor Test Stand

Shipments of their newest design universal hydraulic governor test stands are now being made by the Marine Pumps Division of Diesel Control Corporation, Wilmington, California. Developed originally for the testing and calibrating of high speed engine hydraulic governors, the Unitest Model D11-10,000 is now equipped with adaptors for large engine and turbine governors of the Woodward, Pickering and Marquette types.

A unique feature of the Unitest governor test

stand is its ability to simulate actual governor



operating conditions as though installed on the prime mover which it is to govern. Variations of the driving motor speed are controlled by a sensing unit and the ability of the governor to maintain its prime mover speed can be predetermined by measuring the amount of droop and other characteristics of the governor on test.

Incorporated in the Unitest governor test stand is its own lubricating oil tank, filter and thermostatically controlled heater system for the oil to be used while testing the governor. A lubricating oil pump is provided for both filling the governor and for use with governors which require pressure service to the unit. Gauges for oil pressure, temperature and governor speed are located on the panel. Switches are provided for the lubricating oil pump, heater circuit and governor driving motor. The electronic variable speed drive is capable of a wide speed range to meet requirements of all standard hydraulic governors. The only power required by the Unitest unit is single phase, 220 volt current.

(IT'S NEW)

#### Don't Forget!

Locomotive Maintenance Officers' Association holds its annual meeting in the Sherman Hotel, Chicago, starting on Monday, September 16th. Put it on your calendar and arrange to be there. It is always a well worthwhile meeting and it will be even more worthwhile this year.

#### DIESEL ENGINE CATALOG

The purpose of this little advertisement is to tell you about Volume 22 of DIESEL ENGINE CATALOG which is now available, entirely revised and rewritten. This is the 22nd edition of the book that has earned the name of "the bible of the industry."

All smart diesel engine salesmen carry this book around in their car. When they run into some new competition with which they are not too familiar, the DIESEL ENGINE CATALOG gives them full, accurate information when they need it most.

The consulting engineer keeps this book in his reference file. It immediately gives him all data on diesel engines coming within a given horsepower range, speed range and weight range.

People who sell, people who buy, people who use diesel engines need this new, fully illustrated, up-to-the-minute volume. It has been completely revised and expanded. Orders are now being accepted for this latest edition. Price \$10.00 prepaid.

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### Sales Engineers Appointed

The appointment of W. C. (Bill) Young and Harry A. Cesarin as Sales Engineers to Cooper-Bessemer International is announced by C. S. Cooper, President of Cooper-Bessemer International. In these new capacities, Mr. Young and Mr. Cesarin will devote their efforts to the sales, application, and engineering of engines and compressors for shipment outside of this country.

Mr. Young is a mechanical engineering graduate from Marquette University. He was first associated with another engine builder as Sales Engineer before coming to Cooper-Bessemer. Mr. Cesarin is an engineering graduate of Ohio State University and was associated with another manufacturing organization before joining Cooper-Bessemer, where he received his engine and compressor engineering training. Cooper-Bessemer International directs the sales and service of reciprocating and centrifugal compressors, diesel engines, gas engines and gas-diesel engines for use in petroleum, petrochemical and power generating and general industries throughout the world. Its offices are at 25 West 43rd Street, New York 36, New York.

### Big Government Order

Preparedness to swiftly answer emergency calls to action for the Air Force's new F101 Voodoo and F102 jet aircraft will be hastened by a \$2,300,000 purchase of trailer-mounted Caterpillar D375 diesel electric sets by the Air Materiel Command. These 150 kw electric sets will be used throughout the world to supply power for warmup, calibration and starting these new supersonic fighter-bombers and interceptors. The F101, built by the McDonnell Aircraft Corporation, has an estimated range of 2,500 miles with speeds up to 1,300 miles an hour. The Convair delta-wing F102 interceptor is the only all-weather aircraft in the supersonic Century series now flying, and is considered the only aircraft now in inventory which can find and reach a B-52 or Russia's Bison bomber.

Three other military orders placed at this time, two through the Chicago Procurement Office, Corps of Engineers, and one by the U. S. Navy, bring the total of the four orders with Caterpillar Tractor Co., Peoria, Illinois, to \$4,760,000. In addition, these contracts include options for purchase of parts up to 20 percent of the original contract value. The Department of the Air Force has placed a \$1,550,000 order for 250 kw Caterpillar D397 diesel electric sets to provide power for Air Control and Warning Centers across the continent. Three sizes of tractors, totaling \$270,000

were ordered by the Bureau of Aeronautics (Air Marines), U. S. Navy. Caterpillar DW15 tractors with D318 engines and torque converters are being purchased for towing aircraft and ramping seaplanes. Cat No. 977 traxcavators, equipped with bulldozers and Hyster towing winches, and Cat No. 955 traxcavators, equipped with bulldozers, are included in the order. To help carry out

Operation Deep Freeze 3 in the Antarctic, the Department of Navy has placed a \$640,000 order for 39 machines. Included are: 5 low ground pressure Cat D8 tractors, 3 standard gauge D8s, 3 Hyster TLA8 cranes for the D8s, 6 Cat No. 955 traxcavators, 6 No. 955A bulldozers, 4 Cat D4 tractors with Hyster hydraulic cranes, 5 Caterpillar D315 twin-arc Welders, 1 D342 diesel electric Set, 1

D315 diesel electric Set, 3 Cat D342 diesel engines, and 3 Cat D315 diesel engines.

### Filter Cartridge

The Hilliard Corporation, Elmira, New York announces a new high flow rate-low pressure drop filter cartridge, type PL, for the filtration of oil, water and



This brand new edition of DIESEL ENGINE CATALOG is now available. It is the biggest, most complete volume published to date, with more new sections and information on new engines and accessories than ever before—still only \$10 per copy.

many other liquids. From the Hilco laboratories, as a result of research over the past three years, Hilco has patterned from exacting specifications, an entirely new filter cartridge. The type PL filter cartridge permits higher flow rates, with lower pressure drops than previously obtained.

The PL filter cartridge consists of a fine

quality filter paper, impregnated with a heat stabilizing resin, which is pleated, and cured at the stabilizing temperature. This extended surface-type filter is then formed around a metal center tube, and the end plates and a protective shield are attached by a special Hilco process. The PL filter cartridge is ideal for full flow filter applications and will filter out particle sizes down to

5 microns with continuous recirculation resulting in even finer filtration. For complete details write: The Hilliard Corporation, Dept. PL, West Fourth Street, Elmira, New York. **ITS NEW**

#### Trucks Purchased

Societe Des Petroles d' Afrique Equatoriale Francaise has purchased 26 Ken-

worth trucks for use in Gabon, West Africa. The Kenworths will be delivered in July by ship from Houston, Texas, to Port-Gentil, Gabon. The trucks will be used to haul drill rigs, heavy equipment, supplies and portable housing facilities by the SPAEF firm which is moving into the production stages of full-scale oilfield development. A well-established concern, SPAEF has been engaged in preliminary exploration and development work in Gabon for more than 30 years.

Placed through Inter-Equipment, Inc., and its affiliated companies abroad, Kenworth distributors in France, North Africa and French West and Equatorial Africa, the order calls for 21 Kenworth Model 552's and five Kenworth Model 853-D's. The entire order was custom-engineered for operating in this African country, whose geography includes tropical jungle growth rising out of soft sands stretching from the coast for substantial mileages to the swampy interior. The trucks will be operating throughout the country, which has an area of more than 103,000 square miles, cut by many rivers. The terrain is without roads except those built or cut-through by SPAEF.

The Kenworth 552's are 6 x 6's and are equipped with oil-field bodies. The fifth wheel is air-operated and retracts into the body. The 853-D's, also 6 x 6's, have Cummins 300 hp diesel engines with Allison torque converters and torque-matic transmissions. These latter units have large 18.00 x 24 sand-type single tires for desert operation. One of four French overseas territories comprising French Equatorial Africa, Gabon with Middle Congo, Ubangi-Shari and Chad extends inland for some 2,000 miles, ending at the Sahara Desert. The SPAEF wells are Gabon's first oil production.

#### Development Engineer

Mr. V. H. Peterson, Vice President-Engineering, Fairbanks, Morse & Co., Chicago manufacturers, has announced the appointment of R. K. Annis to the company's engineering division as development engineer. Mr. Annis, who was formerly assistant to the manager of the company's Kansas City, Kansas Works, will be located in Chicago headquarters. He is assigned to evaluate, coordinate and follow up engineering development projects. He will also work with sales, plant management and factory engineering on all phases of engineering activity. Mr. Annis is a graduate of Ohio State University in mechanical engineering. He joined the Fairbanks-Morse organization in 1949 and has held responsible positions in hydraulic engineering and manufacturing.

# DIESEL ENGINE CATALOG READY TO MAIL - NOW!

The size and format of Volume 22 of this "Bible of the Industry" will be the same as in previous years—a big 400 page book with easy to read page size of 10½" x 13½". The large, wide open format makes reference simple and quick. Each section is fully illustrated with photographs, power curves, specifications charts, and sectional views, as well as full description in the text of the products and their fields of application. You cannot afford to be without it in your business. Be sure of your copy of this Limited Edition by ordering Volume 22 now!

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the coupon now!**

#### The Catalog consists of the following sections:

- 1 ENGINES—All major manufacturers of diesel, dual fuel and gas engines are represented in multiple page sections. Text is supplemented with specifications, power curves, photographs and sectional views.
- 2 TURBOCHARGERS and SUPERCHARGERS—This section of manufacturers is detailed and fully illustrated to give complete information on this increasingly important phase of the industry.
- 3 TRANSMISSIONS—The latest information on torque converters, fluid drives, and other modern means of transmitting power are fully described and illustrated in this section.
- 4 ACCESSORY EQUIPMENT—Recent developments in fuel injection systems, governors, and other key accessory units are detailed and illustrated fully in this section.
- 5 MARKET PLACE—A convenient, time-saving listing of sources from which you can obtain the multitude of items and services needed by the fast growing Diesel Industry.
- 6 ADVERTISING—Leading manufacturers of engines, accessories, and services bring out the important features of their products in attractive, easy to read advertisements to further enhance the reference value of the CATALOG.

#### DIESEL PROGRESS

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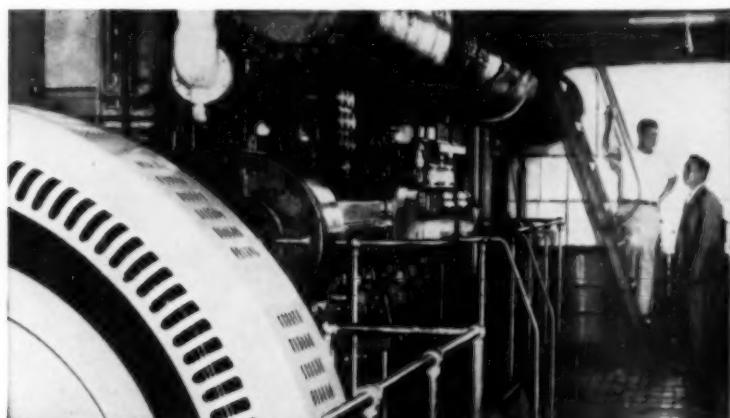
*How Sturgis light plant planned ahead to  
eliminate source of possible power shut down*

Sturgis, Michigan, light plant management in 1946 determined that it might be difficult to satisfy all power requirements if the light plant's large engine, or more than one of its small engines, was down. The plant is equipped with 5 engines—four GM 1,600 H.P. and one Busch-Sulzer 2,475 H.P. Plant management rightly figured that one of the keys to the problem was good lubrication. So, in 1946, STANODIESEL Oil M was tested in one General Motors engine.

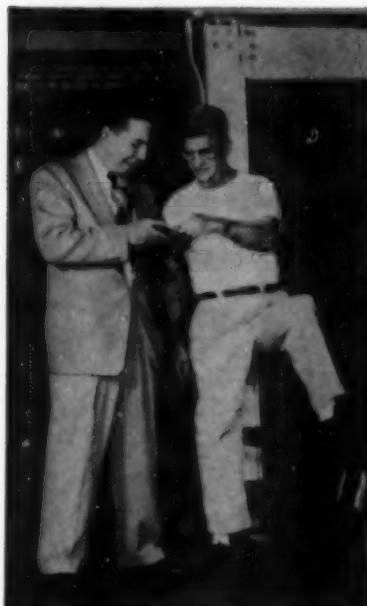
In 1947, based on its performance during the test, all engines were converted to STANODIESEL Oil M. In the nine years since, the plant has never had to shut down power to customers because of engine or oil failure. There have been no wear problems. Engines have stayed clean. There is no ring sticking. Bearing life is exceptional.

STANODIESEL Oil M can give this kind of performance for two big reasons: (1) its highest quality base stock, (2) its additive formula. STANODIESEL Oil M has superior stability. An oxidation inhibitor helps to prevent unwanted increases in oil viscosity. Detergent-dispersant additives keep crankcase, pistons, cylinder walls and other parts clean. An anti-foam agent controls foam.

There's a Standard Oil industrial lubrication specialist near you in any of the 15 Midwest or Rocky Mountain states. Call him for more information about STANODIESEL Oil M. Or write Standard Oil Company, 910 S. Michigan Avenue, Chicago 80, Illinois.



Sturgis, Michigan, light plant has four GM 1,600 H.P. engines and this Busch-Sulzer 2,475 H.P. engine. Engines receive progressive maintenance at 3,500 to 4,000 hours. STANODIESEL Oil M is used in all engines.



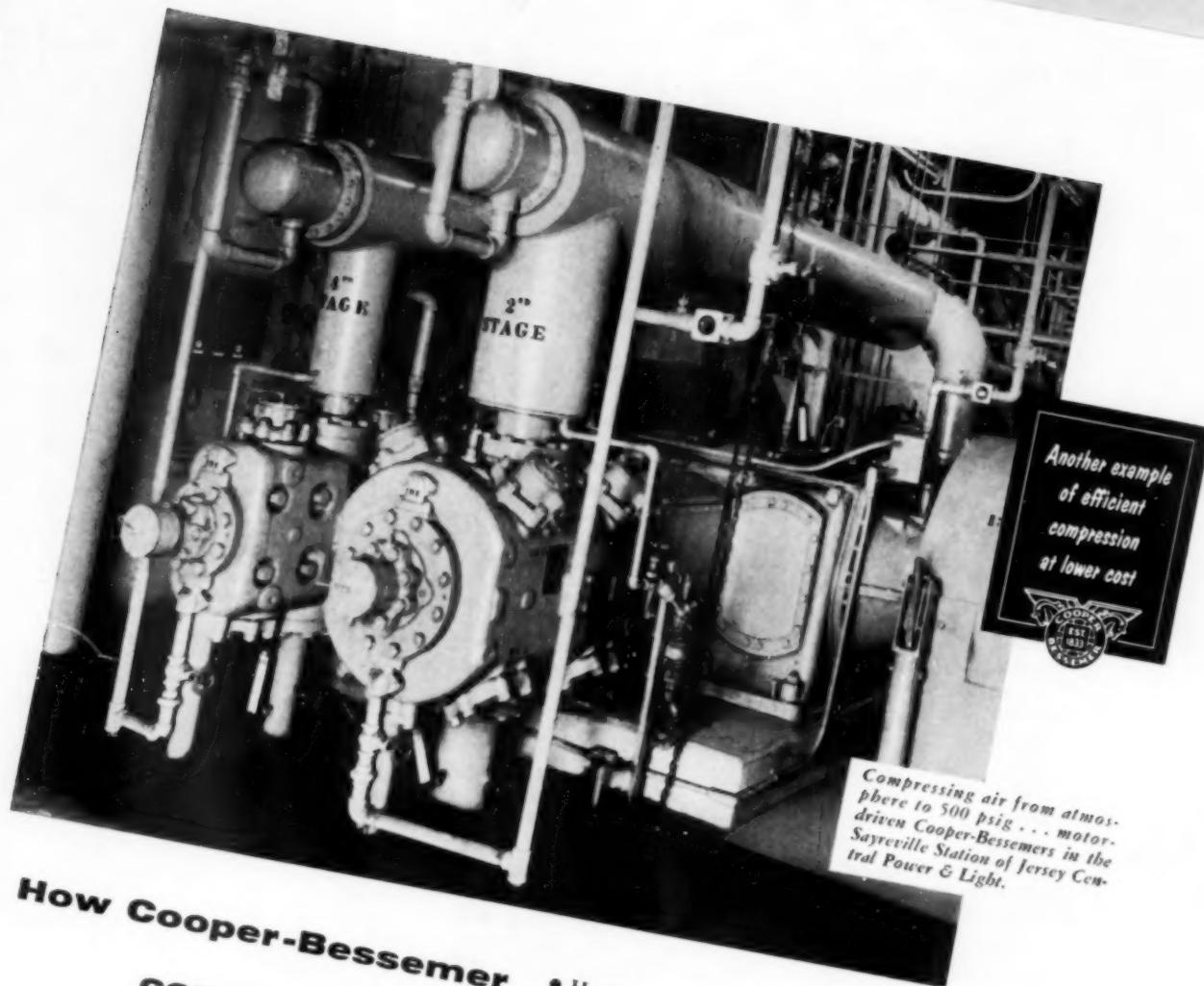
J. J. Threlfall, superintendent and Donald Cripps, Standard Oil lubrication specialist check Don's data book on Sturgis light plant diesels. Don is well qualified as a lubrication specialist. He has been doing this work for nine years. He has an engineering degree from Michigan State University and is a graduate of the Standard Oil Sales Engineering School.

### Quick facts about STANODIESEL OIL M

- Keeps crankcase, pistons, cylinder walls clean.
- Combats deposit and wear problems imposed by use of economy fuels.
- Maintains film on difficult to lubricate areas and parts.
- Eliminates spark plug fouling in spark ignited engines and reduces combustion chamber ash deposits in engines burning natural gas, LPG and liquid fuels.
- Eliminates fuel injector and pump sticking caused by deposits on injector barrel and plunger where fuel and lube oil commingle.

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Equipped with controls for 5-step automatic operation, these Cooper-Bessemer units assure maximum safety, permit minimum attention by operating personnel. Although compact in design, these compressors retain the accessibility feature so often lacking in similar type units.

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